

skin diver

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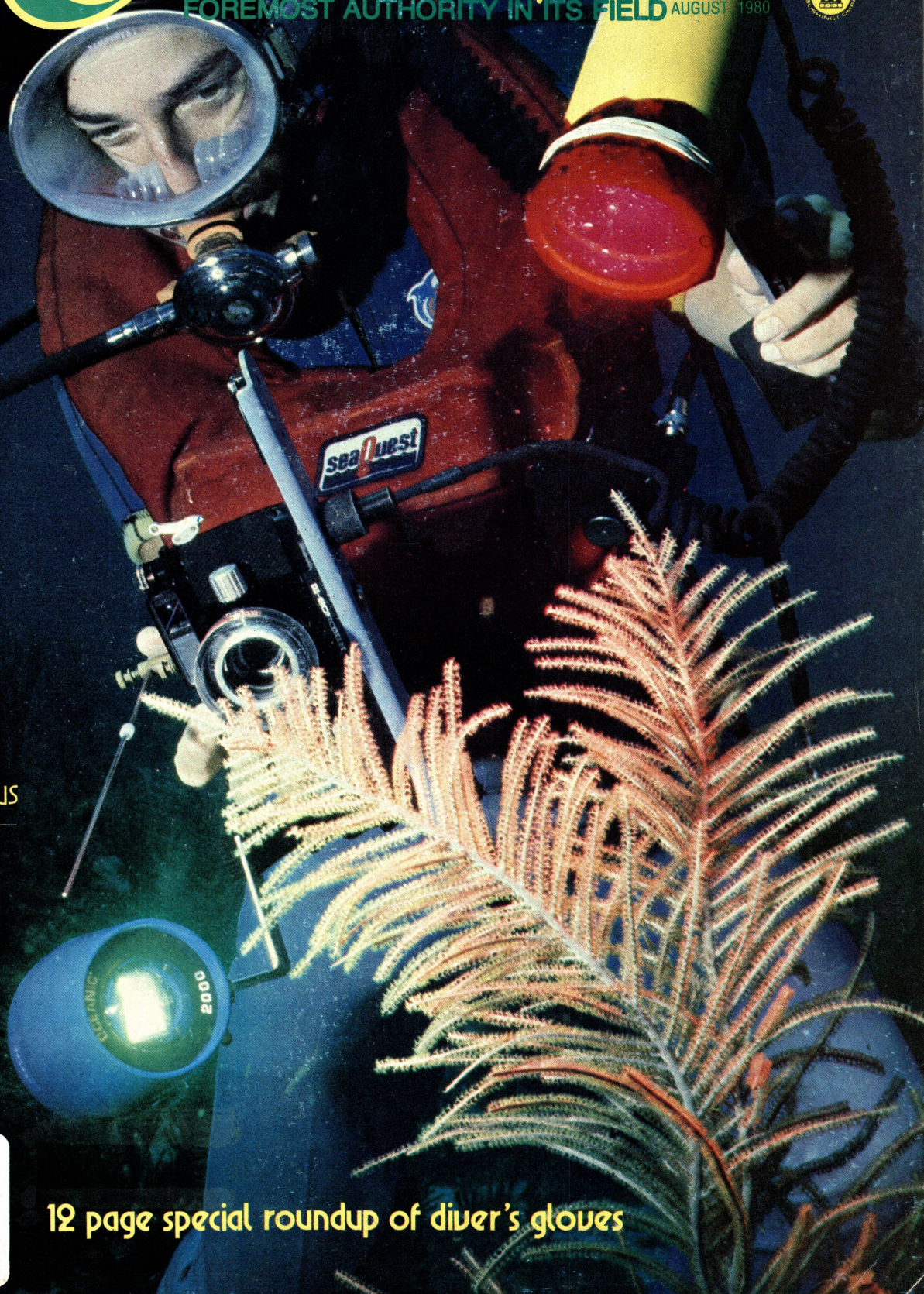
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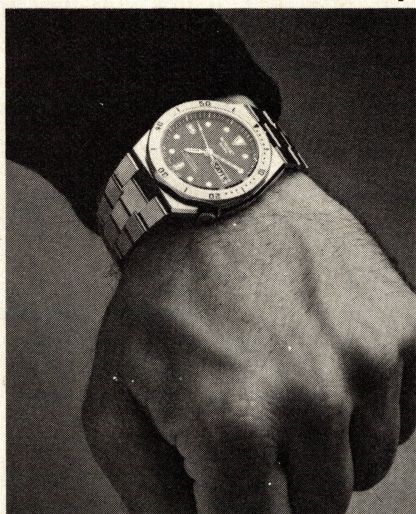
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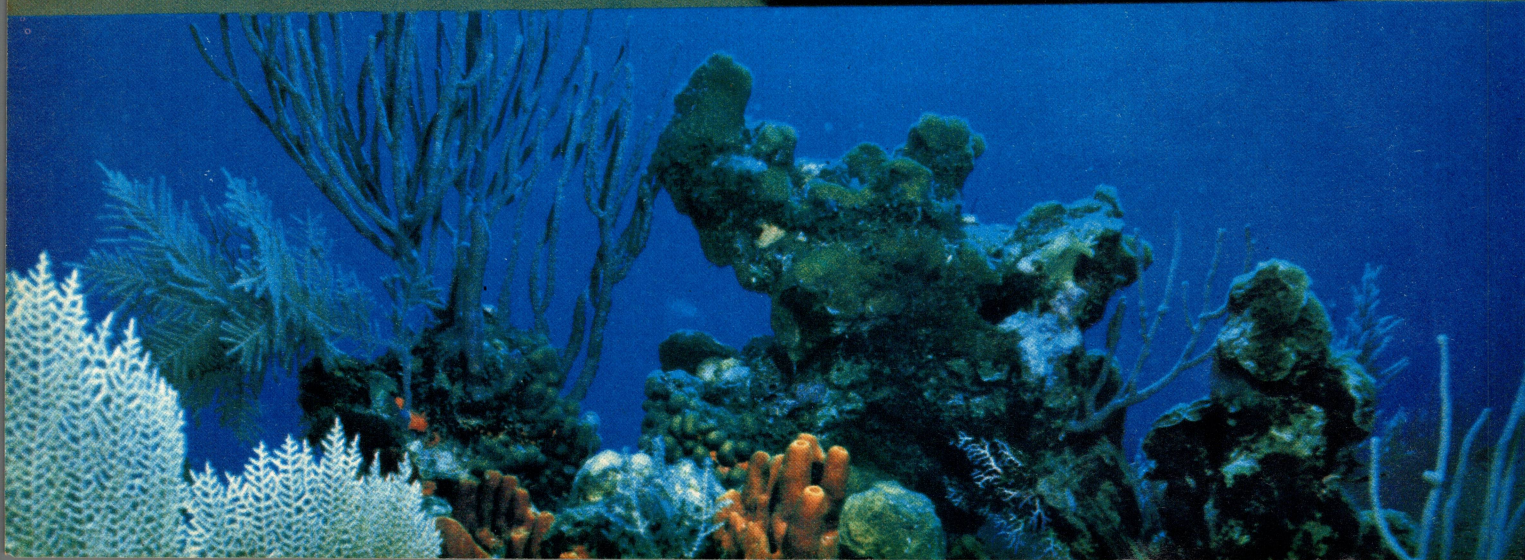
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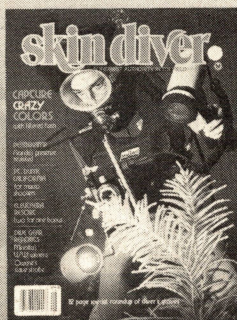
NIKONOS III From Nikon



skin diver

Volume Twenty-Nine Number Eight

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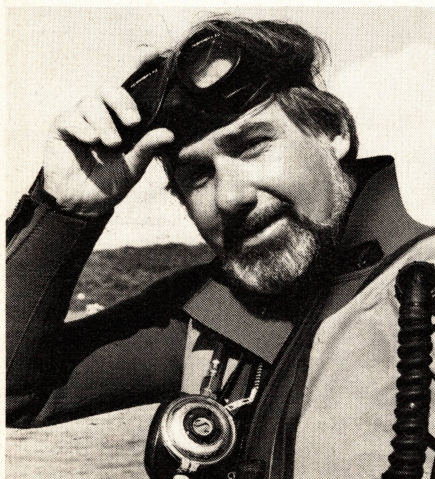
COVER

Jim Church photographed Cathy offshore Grand Cayman on the Little Drop-Off, with a Nikonos, 28mm lens, Oceanic 2001 strobe. Cathy's slave strobes are an Oceanic 2000 and a Leach YS-35.

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SDM Editorial

BY THE PUBLISHER



SIDE-STEPPING THE PITFALLS OF TRAVEL

Was your last dive vacation a disappointment? Did you return home feeling that you had paid far too much for very little diving? Well, you're not alone.

From time to time we receive pitifully sad letters from readers who have endured outrageous situations during their travel overseas. For example, there was the diver who traveled almost two full days to an obscure island resort in the Caribbean only to find the hotel's air compressor had been broken for more than two months and that no diving was available. The new hotel manager was not interested in offering dive services, but had never bothered to correct the information contained in the hotel brochure. Then there was the case of the couple who were veteran divers — they went off to a tropical resort in the Pacific which claimed to offer a scuba diving program. The "program" consisted of a handful of scuba tanks and a mini-compressor which could only pump one tank per hour. This would not have been so bad if there had not been 40 other hotel guests eager to try scuba diving. The couple was looking forward to making three dives per day but ended up making a total of three dives during an entire week. They eventually departed brokenhearted. Their vacation had been ruined. The best story is that of the

know-nothing travel agent who blissfully booked a couple of divers on a glass bottom boat ride claiming it was an underwater tour!

While these horror stories might seem funny to some, they are heartbreaking experiences to those involved. There is nothing worse than saving your money for an entire year only to have it wasted on a poorly planned trip. Most of these incidents are born out of combined ignorance. They are a result of divers who know nothing about travel, attempting to deal with hotels or travel agents who know nothing about diving. It is the classic case of the blind leading the blind.

If you are interested in planning your next dive vacation wisely, consider the following suggestions for avoiding those devastating pitfalls in the complex jungle of the travel industry. Here are a few helpful hints on getting off to a good start.

Check the ads: How does one tackle the mind-boggling job of selecting an appropriate dive resort? Strange as it may sound, start by reading the travel ads carried in SKIN DIVER. An average issue carries approximately 130 travel ads which range in size from a full page down to a tiny listing in the Where-To-Go Travel Section.

Resorts that advertise in a magazine such as SKIN DIVER are making a strong statement of commitment. They really want your business. They have spent a lot of money buying such ads simply to tell you that divers are welcome at their resorts and that they are eager to have you as a guest. It is these advertisers who generally offer the best services and the best facilities. Chances are that a resort hotel that does not advertise to divers is probably not interested in your business.

Send for brochures: Once you have perused the ads in current and past issues of SKIN DIVER, select 6 to 12 of the most interesting spots and send for brochures and price quotes. Although it may take you some time to get all the answers, this method is perhaps the most inexpensive way to start shopping for a dive vacation. Your request for information carries no obligation, and you won't be pressured into buying something you really do not want.

Most dive resorts will respond with brochures and information which are very helpful. Such material will provide you with a fairly good overview of the whole

dive travel picture and give you a few clues as to what such a vacation is going to cost. One word of caution however: Don't make a hasty choice based purely on price alone. The cheapest dive trip package may not necessarily be the best. Count the number of dives you are getting and compare it to the price you are paying.

Research your choice: Reviewing the brochures is only a beginning. It will help you to narrow down your selection to perhaps three or four destinations. Now it is time to really go to work and research those spots which interest you the most.

Try to collect everything which has been written about those locations which appear most promising to you. Again, SKIN DIVER is a perfect place to start, since each issue contains a wealth of information about dive travel and resort destinations all over the world. In a period of one year SKIN DIVER publishes approximately 220 pages of editorial information about island destinations, dive resort hotels, dive resort operators, dive tour operators and airline services to those destinations. Every month, there are in-depth articles on specific resorts and the underwater attractions they offer. At least five or six times a year SKIN DIVER also publishes comprehensive special supplements on major dive resort areas such as: the Bahamas, Cayman Islands, Cozumel, or the Virgin Islands. In addition to the regular articles and special sections, SKIN DIVER publishes monthly news and information about newly established resorts, dive facility expansions, new dive boats, and dive personnel changes. Chances are pretty good that SKIN DIVER has published one or more articles on those dive resort destinations you have chosen.

Don't just stop with SKIN DIVER. Check out other publications for different points of view. There are travel newsletters, travel magazines, and newspaper travel sections which also publish articles on many resort destinations which have dive facilities. While these articles and reports may not be purely dive oriented they can sometimes prove helpful.

Seek out references: One of the best ways to dig out the true facts about a particular dive resort is to find another diver who has recently been there. He or she can give you a first hand report on what the resort is like as well as helpful hints on

(Continued on Page 14)

a good condition for every situation



Let's face it, diving is a sport that takes place under a great variety of situations. There is no single wet suit to cover every possible dive situation. Choosing a wet suit that will prove satisfactory under the greatest variety of conditions isn't easy - there are a lot of wet suits out there to choose from. ☐ But there is a wet suit manufacturer who makes a wet suit for every dive situation and that's Sea Suits. Sea Suits makes a full line of dive suits. A dive suit for every condition plus one more. That extra condition is quality. Sea Suits emphasizes quality because quality is the one condition that covers every condition. Nothing serves as well as having the best. ☐ If you want the best no matter what the situation choose a Sea Suits. We know quality satisfies... it always has and no matter what the conditions it always will.



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R For Divers

BY CHARLES V. BROWN, M.D.

Three years ago Skip Dinger of Centreville, Michigan dove from an embankment into safe water and broke his neck. He'd been smart enough to check the water depth ahead of time, but hadn't noticed the submerged picnic table that brought him to a sudden stop. His spinal cord was injured and now he's a paraplegic. He can't move his legs or torso. But he's young and full of vim and vinegar and wants to scuba dive. Is there any hope?

Answer: There surely is. On land a paraplegic cannot support his weight against gravity, so he's confined to a chair. Under the water gravity is no problem. He can move up or down by using buoyancy control, and he can go any which way by using his hands. So while a paraplegic is less mobile in the water than a normal person, he's better off than on land.

A few instructors have realized this and, braving legal liability, accepted the handicapped into their basic classes. To our knowledge, not one has been sorry.

Jim Hollis of Scuba World, Orlando, Florida recounted his paraplegic teaching experience in the Underwater Forum column of SKIN DIVER's April, 1979 issue. Duncan Milne of Newport Beach, California, himself a paraplegic, has been working to establish dive programs for the handicapped in community colleges. His presentation on the subject appears in the Proceedings of IQ10, available from NAUI, Box 630, Colton, CA 92324. If readers know of other programs, please write and share them.

Question: A manic-depressive Texan wants to enjoy himself this summer with some fancy Caribbean diving. The fly in the ointment is his medication. Will lithium carbonate cause trouble?

Answer: Lithium is widely prescribed for manic-depressives. There are a lot of them, and we imagine that a number either dive now or will soon. Since we're unaware of any reported experience with lithium in diving, we'll have to judge by its known physiological effects. It's chemically related to sodium and so influences sodium transport across cell walls — a process critical to nerve and muscle activity. It also figures in the metabolism of the hormones epinephrine and norepinephrine — important in handling stress.

Toxic effects of lithium are many. Early ones include tremor, muscle weakness, diarrhea, vomiting, dizziness, and heart dysrhythmias. Others are excess urination, confusion, low blood pressure, and

blackout. Unfortunately the adverse effects begin to appear at a dose level only a little above that necessary for therapeutic benefit, and occasionally even within the normal range. Individuals do vary in sensitivity to the drug, and a person seems to tolerate it less well when he doesn't really need it — that is, when he's not having a manic episode.

It's obviously safer not to dive. On the other hand, if you do dive, the risk can probably be kept small by observing certain conditions. These are that you have a normal physical exam and EKG, that a blood test shows your lithium level to be well within the approved range, and that you feel entirely well. Another strategy would be to discontinue the lithium a day or two before diving. Since its half-life in the body is about 24 hours, that should preclude a toxic blood level. We're not giving you advice — just tossing out ideas. Check them with your doctor and make no decisions without his blessing.

Question: George McFarland, dive-master for the Greensburg, Pennsylvania Fire Department Rescue Team, is concerned by the ups and downs of search and recovery operations. The team will descend to between 15 and 60 feet, complete a pattern, surface, and repeat the cycle indefinitely. He's read articles linking bounce dives to chokes, and he'd like to know of any special tables or rules of thumb that will keep his team out of trouble.

Answer: Let's define some terms. In sport diving jargon a bounce is a short dive with direct descent, usually to a respectable depth, and a direct ascent. It is not multi-level and there are no decompression stops. Shallow drops can be bounces too, but are of little significance in terms of bends and are not ordinarily dignified by the title. The term chokes refers to that form of serious decompression sickness in which enough bubbles are trapped in the lungs to cause discomfort, shortness of breath, and cough.

A single bounce dive within table limits poses no problem. Repeated bounces are something else — they introduce two kinds of problems. The first is that each ascent produces venous bubbles which become trapped in the lung's capillary bed. Too many ascents in too short a time will bring on chokes. The second is that once bubbles are stuck in lung capillaries, another descent might squeeze some of them small enough to pass on through and circulate with the blood. Upon ascent they'd inflate, and any that were on the arterial side of the circulation when they became too large to traverse capillaries could become clogged in some important area and cause bends. This can happen even when the tables are not violated.

There are no guidelines that spell out the maximum safe depths and frequen-

(Continued on Page 19)



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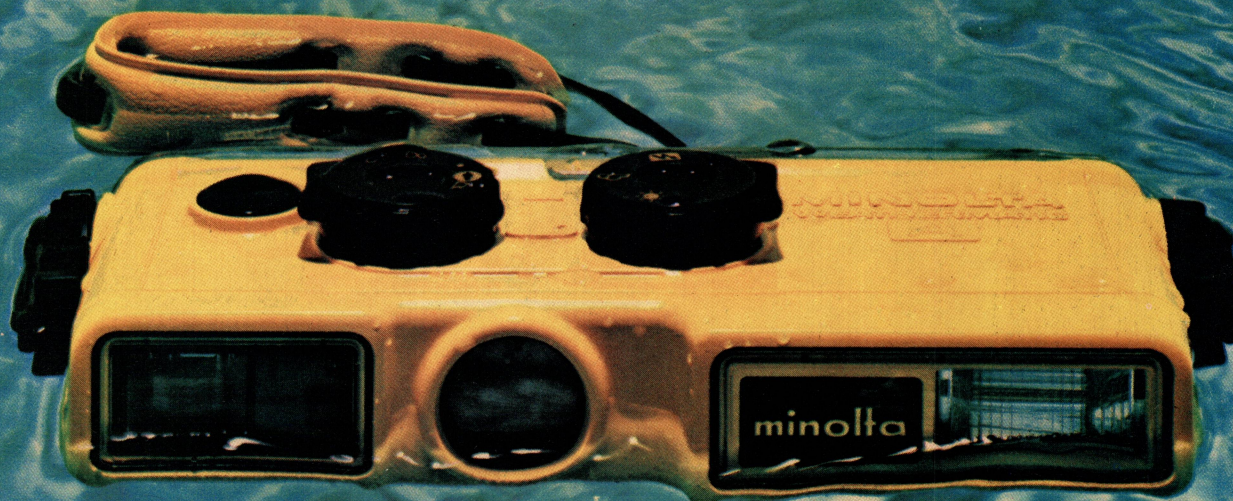
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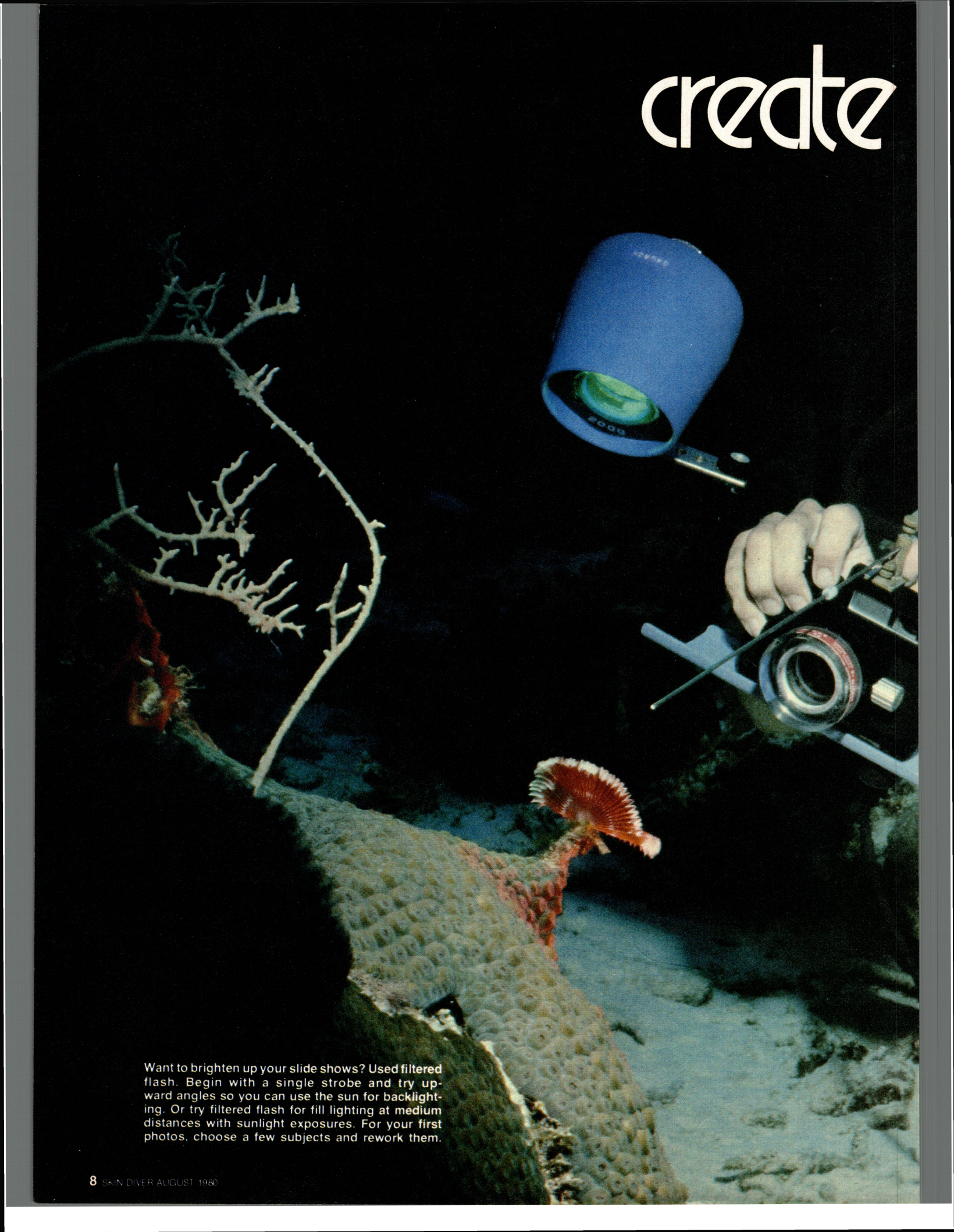
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Want to brighten up your slide shows? Used filtered flash. Begin with a single strobe and try upward angles so you can use the sun for backlighting. Or try filtered flash for fill lighting at medium distances with sunlight exposures. For your first photos, choose a few subjects and rework them.

crazy color

with colored filters

Tired of the same old lighting techniques? Looking for some new ideas to brighten up your slide show? If so, consider using filtered flash — a topside technique that you can easily adapt to underwater photography.

For our first attempts at filtered flash, we decided to use two strobes — one emitting red light, the other green. Actually, the two strobes could produce three colors. Wherever the red and green light overlapped, the two colors would produce yellow. And because we wanted intense, vivid colors, we decided to concentrate on close-up subjects. (Note: Mixing colored lights produces different results than when mixing paints.)

The first step was to modify the strobes to produce the colored light. For the red strobe, we wrapped two layers of red acetate (available at art supply stores) over the front of our YS-35, and held it in place with a strong rubber band. And for the green strobe, we taped a small piece of green acetate over the front port of our Farallon/Oceanic OS-2000 cordless slave strobe.

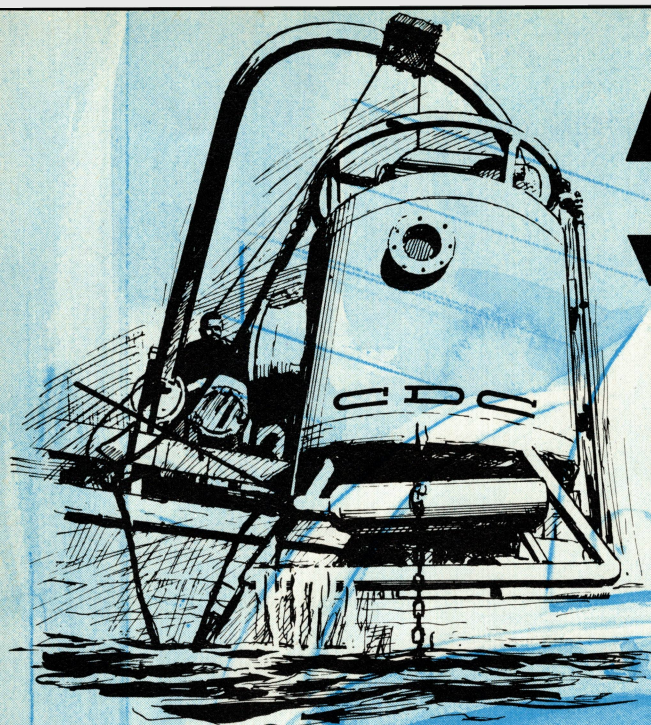
The next step was estimated exposure. Prior to installing the colored acetates, we measured the output of the strobes with a Wein WP1000 flashmeter. And by measuring the strobes again, with acetate in place, we estimated the difference in light output. As it worked out, we could use our normal ASA 64 exposure settings with ASA 200 color slide film, and filtered flash.

Underwater, we looked for frilly subjects with highly textured surfaces. Extreme side lighting — from opposite sides of the subject, or from top and bottom — produced the best results. The red and green light would be separated at the

Text and Photography by Jim and Cathy Church



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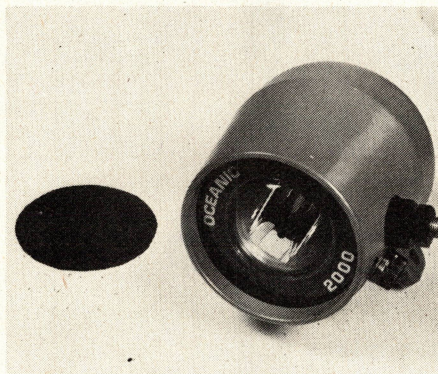
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COMMERCIAL DIVING CENTER

Crazy Colors

edges, but would blend into yellow in the center areas and on the frilly details. And to gain a third source, we tried some upward camera angles and backlit subjects with the sun.



Colored acetate can be taped over the strobe ports.

The results were exciting! While we managed to take some fairly good pictures, the most rewarding part was the joy of trying something new in our underwater photography. But these first pictures only hint at the possibilities. The lighting combinations and angles are almost endless.



55mm filters can be screwed directly into the accessory threads at the front of the SR 2000 strobes.

But enough about our experiments, let's concentrate on how you can use filtered flash. You can get started with only a single strobe. Try upward angles so you can use the sun to backlight, or try filtered flash for fill at medium distances with sunlight exposures. And if you have a slave strobe, systematically work the angles.

One or more SR 2000 strobes can form an ideal system for filtered flash. Attach one regular SR 2000 to the camera with a sync cord, and then place one or more SR 2000 cordless slave strobes anywhere you wish. These compact, submersible strobes have 55mm accessory threads immediately in front of the reflector port. Thus, you can screw 55mm color filters directly over the reflector above or under the water. You can add

extra color by placing pieces of color acetates behind the color filters. For more information about SR 2000 strobes, write to Sonic Research (5111 Santa Fe, Suite H, San Diego, CA 92109) for a free brochure.

With housed strobes, adding color is easy. Tape the color acetate over the strobe reflectors. And for many strobes, special kits of color filters are available for special effects. Just be sure to choose strong filters.

As for exposure, you may also opt for ASA 200 film to compensate for the light blocked by the filters. Remember that you will want to use the highest-numbered stops possible to maximize close-up depth of field. The data sheets accompanying standard filters should give filter factor information. And with acetate sheets, try taking comparative exposure meter readings in air, with and without acetate in front of the meter, to estimate how much light the acetate holds back.

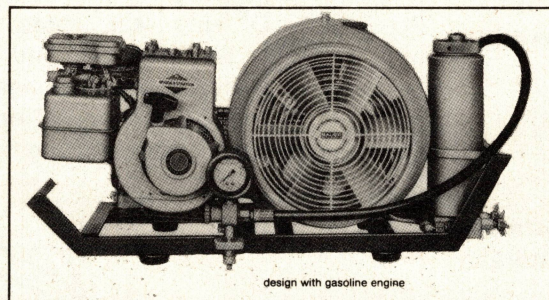
For your first pictures, choose only a few subjects and work them intensively. Bracket exposures by varying strobe-to-subject distances, and experiment with color balance by varying the respective distances between strobes. And one last tip, aim the strobe at an angle slightly behind the subject if you want to partially backlight frilly areas with color.

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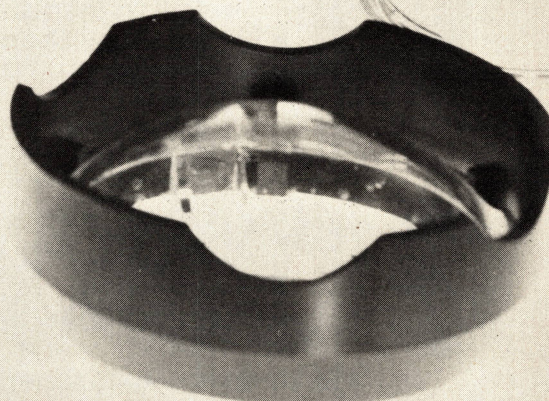
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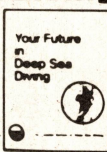


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Editorial

(Continued from Page 4)

what to bring, what to ask for and how to get the most out of your visit.

One word of caution in obtaining personal references of this kind, be aware that such information is probably a little biased depending on the underwater interests and personal requirements of the diver to whom you are talking. Be sure to ask detailed questions and make notes about the answers you receive.

Verify your facts: Because the travel business is so changeable and there is high turnover in hotel staffing, it is extremely important for you to verify the facts about the resort you intend to visit. Is that divemaster with the terrific reputation still working there? Is the dive boat still running well? Is the dive equipment in good shape? Is the airline schedule still the same or has the flight been changed to a different day?

One of the best ways to verify such information is by contacting a travel agent who specializes in dive travel and dive tours. These specialists can be easily found in the pages of SKIN DIVER — they advertise their services on a regular basis. You can contact them by telephone or write a letter asking those questions relative to your trip.

There is a pretty good chance that the dive travel agent can give you fast and accurate answers. They travel constantly and personally check out hotel accommodations; dive equipment; dive boats; and underwater attractions. They have the most up-to-date information available because they are in constant touch with the dive resort operators either by telex, telephone or letter.

Do not be afraid to deal with a dive travel agent — it will not cost you one penny more than if you were to book the same travel arrangements on a direct basis. Travel agents make their money on commissions received from airlines and hotels — not from you. In fact, a good dive travel agent can probably save you money as he/she knows all of the best travel combinations for the lowest priced air fares, and hotel packages. Because travel agents deal in volume they often can obtain a better price than the individual traveler. They can also get you airline reservations which would be otherwise impossible, since they often reserve space far in advance.

While there is no guarantee of a perfect dive vacation, the above suggestions can help you turn the odds in your favor. The important thing is to know exactly where you are going and what to expect. Carefully researching your next travel vacation can help you avoid any surprises or disappointments. Have a good trip. ➤

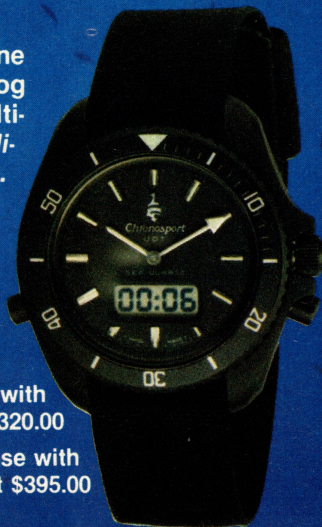
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The Minolta Camera Corporation of Japan recently introduced the world's first amphibious 110 pocket camera — the Weathermatic-A. Cute as a button and sporting a racy yellow exterior, the Weathermatic-A is a watertight, all-weather, all-sports camera small enough to fit into your back pocket. It is unaffected by sea spray, driving rain storms, chlorinated water, dirt, dust or sand. Watersportsmen will find it a perfect photo buddy for sailing, surfing, water skiing, or sport fishing. If accidentally dropped overboard, the Minolta Weathermatic-A will float on the surface and its bright yellow color makes it highly visible in the dark or underwater.

The Weathermatic-A is an ideal camera for snorkelers because it works as well underwater as it does on the surface. Its main disadvantage is that it will operate to only a depth of 15 feet. But wait! Before you slam the door on this neat little camera, consider some of the facts. The Weathermatic-A takes incredibly good pictures, almost automatically, in shallow water. Photographic conditions and lighting are very good from the surface down to 15 feet, which is not only the working depth of this little device but the approximate limit of the average snorkeler.

SKIN DIVER found the Weathermatic-A to be a high quality 110 camera capable of producing negatives or transparencies which can be blown up to 8 x 10 enlargements, and in some cases good enough for magazine publication. All of the underwater photos accompanying this report were actually taken with the Weathermatic-A and faithfully reproduced for this article. Getting interested? Read on and learn how we did it, and how you can duplicate the results yourself.

THE CAMERA

Before going underwater, let's examine the camera. The Weathermatic-A is compact, lightweight and similar in size to most 110's of this design. The body is made of high impact ABS plastic and is O-ring sealed. About the size and shape of

an ice cream sandwich, the unit weighs a mere 12½ ounces on land and is positively buoyant in water.

This little camera has a built-in electronic flash, which eliminates the hassle of external wires or flashbulb sockets. The flash is powered by a single AA penlight battery which provides up to 180 flashes. It recycles in ten seconds and is equipped with a ready light which can be seen easily at the back of the camera and in the viewfinder.

Located at the top of the camera are two easy to grasp, oversized control knobs for setting distance and exposure. The focus knob offers five zone-focusing symbols for distances ranging from three feet to infinity. The exposure/function control knob is a simple three-position control with symbols to indicate settings for: Bright sun, cloudy overcast and flash. When the exposure control is dialed to the flash setting, the aperture is automatically linked to the focus control which provides the correct exposure setting automatically.

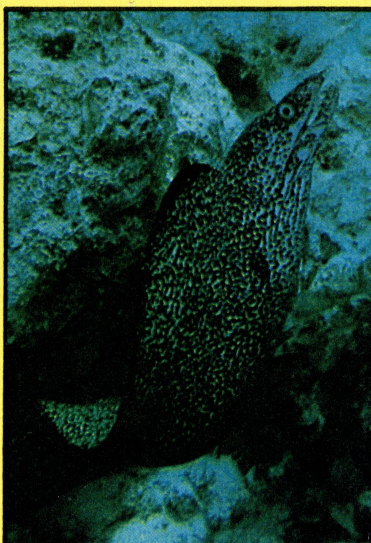
The Weathermatic-A is equipped with a built-in optical viewfinder large enough to be seen through a diver's facemask. The finder has parallax-compensation markings for shooting at close distances. Looking into the eyepiece of the viewfinder, you will see the focus-symbol settings displayed across the top of the frame. The symbol or distance that is selected with the focus knob is indexed in the finder for easy reference while viewing the subject. Also built into the finder is a red indicator light which gives warning when the exposure setting is wrong for existing conditions. This also serves as a readylight that pulsates when the automatic eye flash has recycled. An optional accessory sportsfinder is available for framing but we found the built-in viewfinder to be very accurate and more than adequate.

The heartbeat of this unique camera is the Minolta high quality 26mm f3.5 lens. It is made of four coated glass elements in three groups with a flat glass lens port. Underwater, the lens has a 34 degree angle of view which could be best described

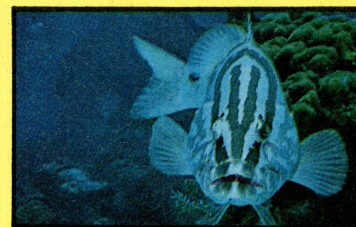
MINOLTA'S weathermatic-A



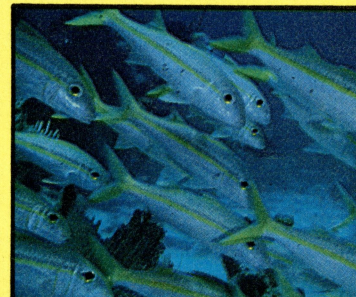
The Weathermatic-A zeroes in on Al Zamrok in his commercial hardhat. Shot four feet from subject, with flash.



A spotted moray eel shot while four feet away, cloudy exposure setting.



Above, a Nassau grouper shot at a distance of three feet, with flash.



Below, a school of goatfish photographed four feet away, with flash.

as a semi-telephoto lens. Above water, the lens has a 45 degree angle of view. The Weathermatic-A has a blade type metal shutter which is preset at 1/200 of a second, and fully synchronized for the electronic flash.

The Weathermatic-A uses easy-to-load 110 film cartridges which give 20 exposures per cartridge. There are a variety of 110 films available, including Ektachrome 64 for color slides and Kodacolor II (ASA 100) and Kodacolor 400 for prints. Film speed settings are automatically adjusted when a film cartridge is loaded and keyed into the built-in light sensor.

TEST RESULTS

In order to evaluate the Weathermatic-A under actual dive conditions, SKIN DIVER took the camera to the Bahamas. We chose Ektachrome 64 color slide film for most of the testing because it is the same type of film used by many for 35mm underwater photography. We also tested Kodacolor 400 print film to see how the camera would perform with a high speed film in low light conditions.

Exposure: The three aperture settings of sunny, cloudy and flash were first compared against each other. The best pictures were those set at flash, providing increased color saturation and filling in shadowed areas. The second best pictures were shot close to the surface (5 to 10 feet) at the sunny setting.

Focus: The camera was tested at all focus settings ranging from three feet to infinity. The best results were from the three and four foot settings — they produced sharp, colorful photos. A single fish (grouper, squirrelfish, etc.) filled the frame at the minimum distance of three feet and a head and shoulder shot of a diver had to be taken at the four foot setting. Longer distance shots at seven feet were not quite as sharp but still acceptable. Anything closer than two and one-half feet was out of focus, which excludes small close-up photo subjects. Because of the 34 degree angle of view, you would have to be almost 15

feet away to photograph a diver with fins.

Depth: The best, most colorful photos were taken in five to eight feet of water. The manufacturer states that the maximum depth for operation is 15 feet. At greater depths, water pressure will push the shutter release in. Flooding may also result.

CONCLUSIONS

After testing the camera and viewing the results, we came to the following conclusions. Minolta's Weathermatic-A is indeed a high quality 110 camera which produces surprisingly sharp photos. The pictures can be enlarged to 8 x 10 prints without any problem. This is a rather significant statement to make considering that the negative size of 110 film is approximately one-fourth that of standard 35mm film.

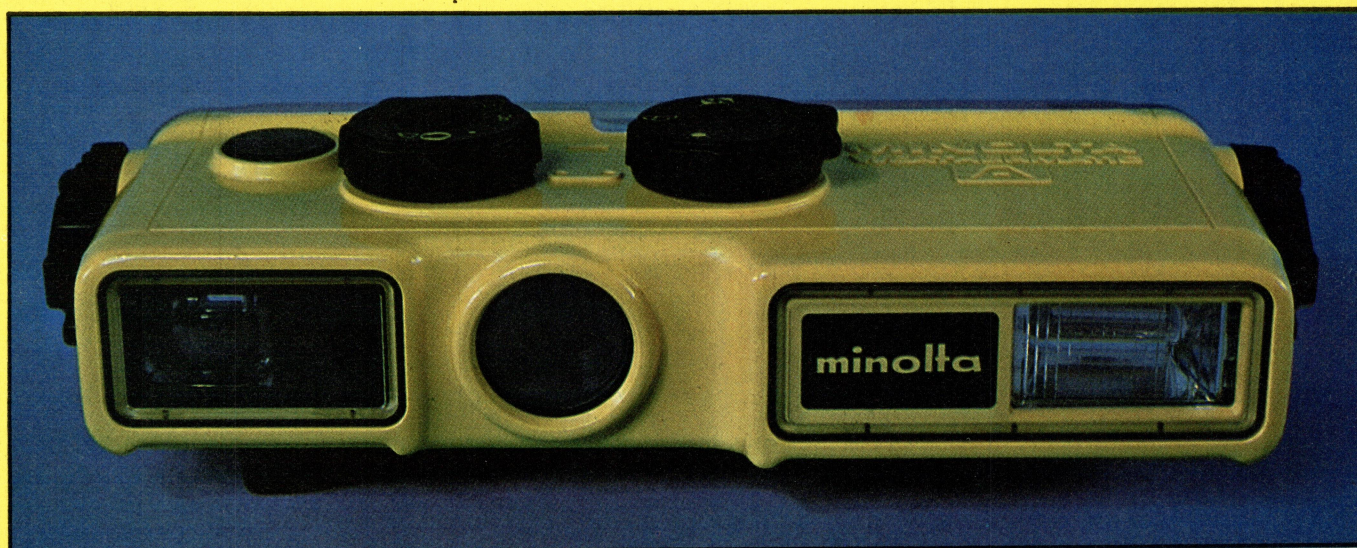
The watertight integrity of this camera makes it the perfect all-weather camera for any type of outdoor sports. It is great for the beach, a boat, water skiing or surfing. Changing film cartridges is quick and easy — simply remove the back cover to open the film-chamber cover. The cartridge can only be inserted into the film chamber in one way, which makes it impossible to load the camera incorrectly.

The Weathermatic-A is perfect for anyone who snorkels, but it is also an excellent snapshot camera for scuba divers who are content to work shallow (5 to 15 feet). If you want to go deeper with a 110 snapshot camera, we suggest you consider an Ikelite housing which is designed for depths down to 130 feet.

The 110 pocket camera is perfect for amateur photographers who want easy-to-shoot pictures for their scrapbooks. The compact size, ease of use and rugged weatherproof body of the Minolta Weathermatic-A will provide sportsmen with a camera when larger, more delicate cameras must be left behind. The Minolta Weathermatic-A has a retail price of \$160 and is readily available in most dive and camera stores. Divers — go forth and shoot! ➤

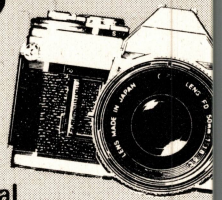
a super sharp snapshooter for snorkel or scuba

text and photography by geri murphy



The Weathermatic-A 110 pocket camera is waterproof, made of high impact ABS plastic, weighs 12.5 ounces, and works down to 15 feet.

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(603) 763-3353
- NEW JERSEY**
The Dive Shop of NJ
Hurlville
(609) 589-2434
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Marlin Scuba
Ramsey
(201) 327-6000
- NEW MEXICO**
New Mexico School of Diving
Farmington
(505) 325-5341
- NEW YORK**
Atlantis II
New York
(212) 924-7556
Dive Master Center
Huntington
(516) 549-9004
Marty Bayerle's Aqua Ventures
Brooklyn
(212) 377-7100
5 Niagara Scuba Sports
Buffalo
(716) 875-6529
Northeast Divers Inc.
Schenectady
(518) 374-1010
Seaquatics Systems
Middletown
(914) 343-2858
4 Westchester Dive Center
Port Chester
(914) 937-2685
- NORTH CAROLINA**
Discovery Diving Co.
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Olympus Sports
Morehead City
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(513) 890-6900
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Cincinnati
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Sub Aquatics, Inc.
Northfield
(216) 467-5575
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Inland Reef
Tulsa
(918) 838-0987
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(503) 620-6993
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- SOUTH CAROLINA**
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Blue Water Divers Inc.
Eau Claire
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Fond du Lac
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Fontana A-N + Outdoor Sports, Inc.
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Exciting Prizes

GRAND PRIZE WINNER

In addition to local and regional prizes, the Grand Prize winner will enjoy a deluxe, eight day/seven night dive vacation (includes air fare from Ft. Lauderdale, Florida) to beautiful San Salvador Island, at the Riding Rock Inn (a PADI Five-Star Training Facility), and an Encore 7602 two-projector programmable Dissolve Unit (compliments of Mirage Audio-Visuals). The winning photograph will also be featured on the cover of *The Undersea Journal*.

TEN REGIONAL WINNERS

Local winners are entered into the International Competition. The ten Regional winners (nine U.S. regions, one International) chosen receive custom 16 x 20 inch color prints of the winning slides (compliments of Scuba Chrome), publication in *Skin Diver Magazine* and *The Undersea Journal*, exhibition at PADI's 1981 "Fluid Visions" exposition, and entrance into the Grand Prize judging.

OVER SIX HUNDRED LOCAL WINNERS

Diver gear, dive trips, and many other prizes will be awarded to local winners at nearly 200 participating PADI Training Facilities around the world.

ENTER ONLY AT A PARTICIPATING PADI TRAINING FACILITY

COMPETITION RULES

1. The PADI Underwater Photography Search Competition is open to all amateur photographers. **Only underwater photographs will be accepted.**
2. **ALL ENTRIES MUST BE SUBMITTED TO A PARTICIPATING FACILITY FOR LOCAL JUDGING. Local winning entries will then be sent to PADI Headquarters for international judging.** Applicants may enter as many photographs as they wish; photographs may have been taken any time with no geographic restrictions.
3. An Entrance form and a \$4.00 fee per entry to the participating Training Facility must accompany all photographs submitted. The completed form acknowledges reprint rights for PADI International when proper photographic credit is given. The utmost care and handling will be given all entries, but no responsibility will be assumed by PADI International or any PADI Training Facility. Photographers retain ownership, and all entries will be returned after the judging has been completed.
4. Winners shall be chosen in one category, color slides. **Participant's name, address, telephone number, facility name, and the title of the photo must be printed clearly on the back of each entry.**
5. Local judging will be done by PADI Training Facility staff members, international judging will be done by the PADI Underwater Photography Search Competition Committee.
6. Winners will be chosen by a point system based on technique, lighting, and composition. Decisions by the judges shall be final.
7. The Search Competition shall begin August 1, 1980 and end September 30, 1980. National winners will be announced in February, 1981.



TODAY'S LEADER IN DIVER EDUCATION

2064 N. Bush Street Santa Ana, CA 92706 (714) 953-7555

Rx for Divers

(Continued from Page 6)

cies of repeated bounces. If surface intervals are less than ten minutes, Navy rules will lump all the dives together into a single one; allowing, for example, a total bottom time of 200 minutes at 40 feet or 60 minutes at 60 feet. This may not be entirely safe. If surface intervals are ten minutes or more, Navy rules would treat the dives separately. Take a search pattern that calls for six minute bottom runs with 10 to 15 minute surface intervals. Repetitive dive calculations would allow 11 dives for a total of only 66 minutes at 40 feet, or five dives for a total of only 30 minutes at 60 feet. This is unduly restrictive.

Decompression meters won't solve the problem either. Conventional models are quite unphysiological, taking no account of silent bubbles, and the new electronic models are programmed to mimic the Navy tables.

Although we can't come up with a formula, experience has shown that few people get hurt if they stay well within table limits, especially when deeper dives are involved. An excellent safety precaution is to ascend much more slowly than the rules require — say 30 feet per minute. 🐟

SEA OF CORTEZ

A completely re-edited version of, *Come Dive With Us*, is now available for rental or purchase. Using scenes taken over a 15 year period, the film illustrates the beauty and excitement divers encounter in the Sea of Cortez. This 25 minute, 16mm color/sound film includes scenes of a 35 foot whale shark, numerous scenes of hammerhead shark schools, and ballet sequences of giant manta rays and sea lions.

The film was premiered at the UPS SEA '80 U/W Film Festival. For information contact: Ted Rulison, 3063 Cambridge Road, Shingle Springs, CA 95682. 🐟

WRECK DISCOVERY

Seaborne Ventures, Inc., a Key West, Florida based treasure salvage company, has announced the discovery of a wrecksite believed to be a galleon of the Spanish treasure fleet of 1567. Working under an exclusive government contract with the Commonwealth of Dominica, northernmost of the Caribbean's Windward Islands, Seaborne's dive teams have begun excavation on a site that has yielded china and ceramic artifacts that positively date to the 1500's. Dennis Standefer, president of Seaborne Ventures, Inc., said that the site is in an area on Dominica's northern coast where research has indicated the treasure fleet was lost in a storm. 🐟

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DOLT Deep Water Dive Bag

- Capacity — huge 4600 cu. in.
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DOLT offers a complete line of dive bags. There's one to fit your needs! So take your gear & "stow it"...in a DOLT!



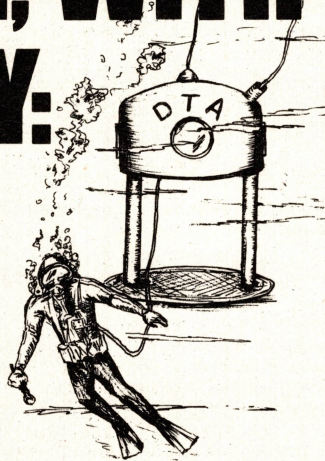
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Send \$2.00 for all new 1980-81 Catalog offering complete air/mixed gas Commercial Diving Course.

Diver's Calendar

September 20 Vision 360 International Diving Symposium & Film Festival, Buffalo State College (Contact: Dallas Edmiston, PO Box 842, Buffalo, NY 14221)

September 20 Vision 360 U/W Photo Competition (Contact: Ron Smith, PO Box 842, Buffalo, NY 14221)

September 20 Cayman Islands Party, Astro Village Hotel, 2350 South Loop West, Houston, TX (Contact: The Cayman Islands Party, Box 1249, Grand Cayman, BWI)

September 27 NAUI U/W Film Review, John Hancock Hall, Boston, MA, 8 pm (Contact: Fred Calhoun, PO Box 291, Back Bay Annex, Boston, MA 02117)

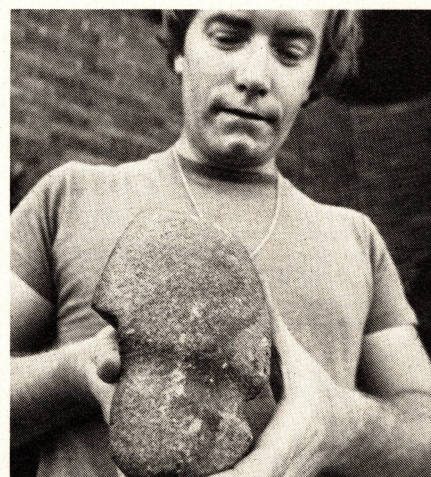
October 24-25 Dive to Adventure with Jack McKenney, Rockford Divers Association, South Beloit/Holiday Inn, 8 pm (Contact: Bill Steinborn, 1385 Randall Dr., Rockford, IL 61108)

October 25-26 Southern California Conference on U/W Education & Film Festival, Orange Coast College, Costa Mesa, CA (Contact: Susan Bangasser, 12724 Valley View Lane, Redlands, CA 92373)

November 1 Inward to the Sea, Seminars & Film Festival, George Washington University, Marvin Center & Lisner Auditorium, Washington, DC (Contact: Bob Riedel, P.O. Box 41010, Washington, DC 20014)

OOPS!

In the June issue of SKIN DIVER this photograph appeared with a story about the discovery of ancient Indian artifacts in Aquarena Springs, Texas. In fact, the



stone battle axe head Donald Hilton is holding was found by him in Lake Okoboji, Iowa. The photograph should have appeared with a news story on that find which ran in our May, 1980 issue. ❧

ADVERTISEMENT

IMPOSSIBILITY BECOMES REALITY

From the windows in his second-floor office in Kent, Washington, Harvey Grohs watches with pride as his carefully chosen craftspeople build quality custom wetsuits daily.

"I started with no employees. I did the designing and building along with running the retail business. I did everything plus promote my foreign trade, teach classes, and build houses. I look back on how I did it, and I say it was impossible", says Harvey.

The "impossible" all began when Harvey first started skin diving in the early 1950's. After many pleasant underwater experiences he decided to open his own retail skin diving supply store in Seattle. With AMF Voit and Dacor as his main suppliers and Rubatex furnishing him with neoprene to build suits, Harvey soon found himself in the manufacturing end of it, too.

Having outgrown the old facilities, Harvey's moved to the plant's present location on Pacific Highway South in Kent in 1973. With the larger quarters Harvey's was then able to branch out into all areas of water sports including waterskiing, surfing and windsurfing. In spite of the large volume, Harvey's is still sold on the concept of custom-fitted suits. "The main purpose of watersports is enjoyment, and the only way a person is going to get enjoyment is to be comfortable and warm" says Harvey, who also incorporates the custom styling and contours of his custom suits into his stock suits. "If a person cannot buy a custom suit, we are going to be sure that he gets the next best thing because of our special styling.

Because of this concept Harvey's has experienced its unusual and "impossible" growth. Harvey's now has agents abroad in Europe and the Orient plus a newly established plant in Canada operating as "Harvey's Skin Diving Wetsuits of Canada" at 9 Hanna Avenue, Toronto, Ontario.

The field is open for more agents to represent Harvey's fast-growing line.

Harvey's thrives on fast, courteous service and bends over backward to please the customer. Harvey's growth has been based on the theory that Harvey spent too many years behind the counter. He knows, therefore, what the customer wants. He has pride in his business and has made the "impossibility" become a reality.



They know what good diving is!

Because they are wearing Harvey's Wetsuits their diving was more fun. There is no finer suit made for sport divers. Harvey's suits are tough, durable and lightweight for maximum flexibility and comfort. The extra attention we put into each suit during manufacturing assures a snug fit that keeps out excess water and keeps you comfortable in the coldest water and longest dives.

Don't settle for less, demand a Harvey Custom Suit . . . and watch each dive become more fun. You can't find a better suit anywhere, at any price.



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THE WET SUIT FOR DIVERS

- Today's divers demand specialized equipment. Your wet suit is important! It should fit well, be comfortable, warm, and made of the best neoprene and durable materials. SUNDANCE Custom Wet Suits have 25 years experience in designing and producing one of the best custom wet suits for divers.
- **SAVE \$ \$ \$** — SUNDANCE specializes ONLY in custom suits. Buy direct from designer and save the high overhead costs large suit makers are forced to add on.
- For the best fit, finest materials, comfort and warmth while diving — choose a SUNDANCE Custom Wet Suit.
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Send for FREE Price List, Measurement Chart and samples of Neoprene.

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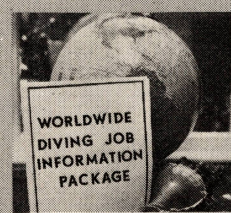
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SUNDANCE CUSTOM
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ATTENTION ALL DIVERS!!!

**THIS IS NOT A COMMERCIAL DIVING SCHOOL!
BUT THE CHANCE OF A LIFETIME!!!**

Dear Sirs,
Thanks to your information package, I have landed a job in the North Sea on an oil rig earning \$130 a day as a diver-tender.
Bill Tack
Calif.



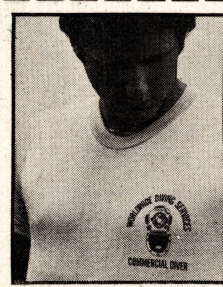
Dear Sirs,
With your worldwide diving job information package, I have found work with a company in my own area, that I never knew existed.
Sincere thanks.
Dan Espa
Alaska

Interested in treasure salvaging or commercial deep-sea diving? Right now divers are needed in the U.S. and throughout the world! If you're thinking of making your sport a profitable profession, or you're a commercial diver seeking world-wide employment, then we can help!!!

Available in limited quantity, the most comprehensive worldwide diving job information package ever compiled. Including over 500 worldwide diving companies, addresses and phone numbers, offering opportunities from the Florida Keys to the North Sea.

Start now on your way to world travel and pay scales in excess of \$190 a day in the United States and even higher overseas!!!!

MAIL TODAY!



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- ☐ Please send my worldwide diving job info package(s). Enclosed is \$10.00.
- ☐ Please send your bonus package (Info package & Worldwide Diving Services Commercial Diver T-shirt). Enclosed is \$15.00 (Plus 75¢ postage & handling).
T-shirt size _____ SM _____ MED _____ LG _____ X-LG.
- ☐ Commercial Diver T-shirt alone \$7.00 (Plus 50¢ postage & handling).

PLEASE PRINT

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Worldwide Diving Services, P.O. Box 3132, W. Palm Beach, FL 33402

PADI FAR EASTERN LIAISON

Roy Goodman has been appointed far east liaison for PADI International. As the first international liaison, Roy's duties will include upgrading and increasing responses to regional educational programs. Roy will be working to provide assistance to PADI International Training Facilities and dive resorts. He will organize instructor educational courses and conduct regional seminars for course directors, PADI instructors and training facilities. For information concerning PADI in the Far East, write to PADI Branch Japan, P.O. Box 59, Ushigomi, Tokyo, Japan.

BOWHEAD WHALE FUTURE GRIM

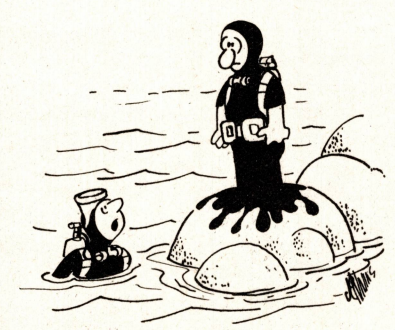
Without immediate Congressional action, bowhead whales may soon be driven to extinction, according to The Marine Wilderness Society. This national marine conservation organization has now initiated a legislative offensive to forestall the demise of the bowhead whale.

Marine Wilderness Society president, Alexander Stone, has stated: "It is no longer morally or ecologically permissible for the U.S. to allow the killing of bowheads by any of its citizens." The Marine Wilderness Society is now actively lobbying for Congressional action to halt the U.S. bowhead whale hunt. Free information and petition blanks are available to all concerned citizens by writing Box 943, Miami, FL 33165.

THE VIKING

Viking-Stavanger A/S has brought their Viking dry suit back to the U.S. with the appointment of Craig Jennings Diving Equipment Supply as representative. Jennings will provide suits, spare parts and service support for the U.S. A repair facility staffed by factory-trained technicians has also been set up to handle modifications or repairs on existing suits in the market.

For information write: Craig Jennings Diving Equipment Supply, 103 Plandome Road, Manhasset, NY 11030.



"Those rocks really get hot."

THE KNIFE FOR ALL REASONS.

The
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The TALON, new from FARALLON/OCEANIC. A new concept in the personal knife. Unique from its razor-sharp stainless blade to its special 100 dura molded neoprene that grips your hand like a glove. Features like monofilament line-cutter, super-honed serrations, and lanyard hole reflect its straight-forward design. Its brushed-finish AUS-6 stainless blade with a Rockwell hardness of 58 resists corrosion and holds a fine edge. The injection molded Knife-Lok™ sheath allows split-second access and replacement with the sure security of a stainless spring-loaded safety mechanism. The TALON—a precision hand tool, for all reasons... at discriminating dive stores everywhere.

*eagle's claw



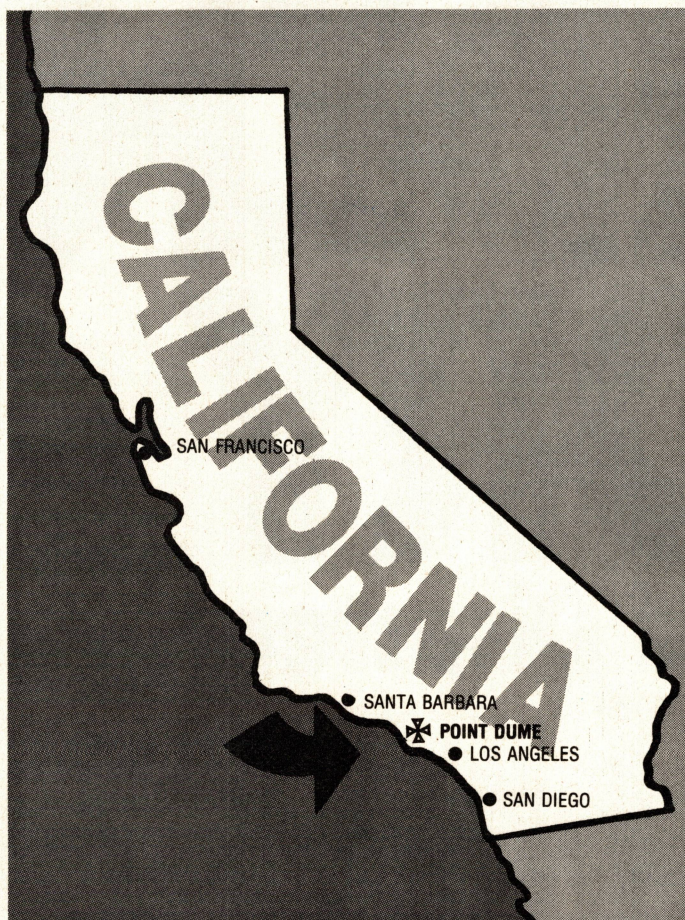
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(415) 352-5001



POINT DUME

*A Southern California
Macro Photographers' Paradise*

Text and Photography by John Dyer



One of the finest dive spots in Southern California, Point Dume is located one mile east of Zuma Beach and two miles west of Paradise Cove, midway between metropolitan Los Angeles and Santa Barbara.

The Southern California coastline offers some great diving, and one of the finest spots is just 40 yards off Santa Monica Bay's westernmost boundary, Point Dume. Located one mile east of Zuma Beach and two miles west of Paradise Cove, the two exposed rocks and surrounding patch reefs lie in 20 to 40 feet of water. The area abounds with nudibranchs, mollusks, starfish, various reef dwelling fish and anemone-covered walls and crevices. It is a macro photographer's paradise. I have photographed five different varieties of nudibranchs on a single dive.

During the summer months, the halibut come up from deep water and the spearfishing for cabezon is good year-round. Lobster appear in calm weather, but move into deep water when the swells pick up.

Visibility varies from 10 to 25 feet with 40 feet possible in the fall — October is the best month. The gentle current that often sweeps the area clean of sediment, providing cleaner water than nearby beach areas, can reach four to five knots at times. Outside the rocks the sandy bottom drops off sharply and one should be extremely cautious of currents and depths here.

Point Dume is a marine traffic zone for whales and sharks moving up and down the coast and one occasionally catches sight of pelagics that make the pulse pound. I have seen gray whales, grampus (I dislike calling them killer whales), large schools of bonita, blue sharks and harbor seals.

Access to Point Dume can be gained by driving from Westward Beach Road and Pacific Coast Highway to the south end of Westward Beach. Parking is \$2 and restroom and shower facilities are adjacent to the parking area. A walk over the rocks to the next sandy beach (Pirates Cove) and a 100 yard swim will get you on the reef.

You can also launch a boat from Paradise Cove and make the two mile run west. There is a \$5 parking fee, and the hours are 6 am to 5 pm seven days a week during the summer. All boats must be out of the water by 4:30 pm. Boat launching from the beach is not allowed. Fifteen dollars, plus a \$15 deposit will get you in and out of the water with the hoist at the end of the pier. Be sure to have two large stainless steel eyebolts or cables on the stern and one on the bow for a pier launching. Paradise Cove will not launch boats larger than 17½ feet.

Point Dume is not the easiest place to dive but this has kept the pressure down, and helped it to remain one of the finest dives off the Southern California coast. 🐙

Point Dume is a marine traffic zone teeming with marine life of all kinds; nudibranchs in particular. In fact, the author reported seeing five different varieties of nudibranchs on a single dive.

THE FLOWER GARDEN STORY

Portent of Disaster

By Bill Barada

A short news story in the Houston Post dated October 29, 1979 stated, "The Environmental Protection Agency (EPA) says it intends to issue wastewater discharge permits to three offshore oil operators near the Flower Garden Banks in the Gulf of Mexico."

The news story also reported that the public had only two weeks to submit written comments before the permits became final and, according to the regional EPA administrator Adelene Harrison, no public hearings would be held unless sufficient comments were received to warrant such a hearing.

The news clipping was sent to SKIN

DIVER by Nelson Herwig, Curator of Fishes at the Houston Zoological Gardens, along with his comments to the EPA in which he stated,

"My initial reaction upon hearing this proposal was one of absolute perplexity. Why would any agency entrusted with the protection and preservation of the environment knowingly and deliberately pick one of the most delicately balanced biotopes on the face of the earth and one of the most critical habitats in the Gulf of Mexico and allow it to become the target of a prototype permit program allowing the dumping of oil and gas operations wastes in the Gulf of

Mexico? It would seem to me that this would be the very last place on the face of the earth that such dumping would be allowed, no matter how safe it might be regarded. There are many environments in the Gulf which are quite extensive in area and which would support a minimal degree of environmental damage via dumping. Why do you pick the most defenseless and irreplaceable area in the Gulf?"

Why indeed? The Flower Garden Banks are tiny, submerged coral reefs that cover an area of no more than ten square miles and they are located in the gulf more than 100 miles offshore from Texas. The banks contain two separate reefs, the East and West Flower Gar-

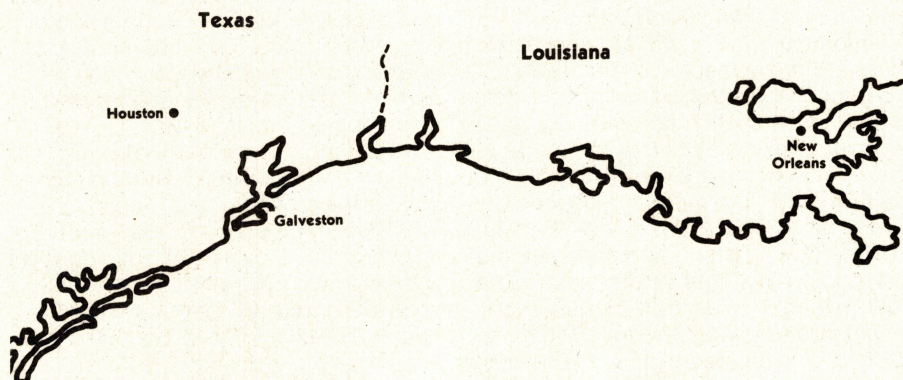
253 species of invertebrates and 103 fishes, then states, "One should always expect to encounter something new." Many of their specimens have not been identified, and the center states, "We have certainly not collected all of the types of organisms occurring on the reef."

The Flower Gardens are a popular playground for divers who report that the bottom in this area is a gorgeous submarine park populated with an abundance of giant sized fish ranging from manta rays to colorful tropicals, plus myriads of gorgeous sea shells that drive malacologists into a state of ecstasy. Among the highly prized species are spiny oysters, cowries, cones, conch

the first permit the EPA has ever issued for offshore oil and gas operations, despite the more than 3000 such rigs already operating in the gulf without a permit.

The EPA's action does not surprise environmentalists and skin divers who are familiar with the Flower Garden story. The oil company permits are simply the most recent incident in a continuing and unrelenting attack on these reefs that has been ongoing for more than 15 years. As reported in both the January and April 1975 issues of SKIN DIVER, the Flower Gardens have been a dumping ground for industrial chemicals since the 1960's. Among the millions of tons of deadly poisons dumped in the area are toxic compounds of insecticides, fungicides, acids, caustics and heavy metals such as arsenic, copper, lead, mercury and antimony.

The EPA was given authority to control ocean dumping and protect the marine environment by the Congress under the



**X Flower Garden Banks
Marine Sanctuary**

"Why would any agency entrusted with the preservation of the environment deliberately allow waste dumping on one of the most delicately balanced biotopes on the face of the earth?"

dens, and each is a truly unique ecosystem with no similar formations known to exist anywhere else in the world. Both reefs are now totally submerged with their tops around 70 to 80 feet beneath the surface. They are so rare that the Medical Branch of the University of Texas in Galveston established a Flower Garden Research Center within its Biomedical Institute in order to study them.

These are the only living coral reefs on the North American Continent that exist outside of Florida. The reef surfaces are a submerged fairyland which support an abundance and diversity of marine life that drive both divers and scientists into poetic descriptive phrases. A book, *Biota of the West Flower Garden Bank*, published by the University of Texas, lists

and turbines, many of which have strange markings and are so rare they have been priced at more than \$1,000 each. (S.D. Jan., 1975.)

Marine scientists consider the Flower Garden reefs as a model ecosystem for the entire Gulf of Mexico. There is little doubt, according to these scientists, that the corals will continue to grow and build until they eventually reach the surface. But the corals are already stressed to their limit of survival and must be protected from additional man-made stresses that would cause their destruction.

Thus, Nelson Herwig's perplexity as to the reasons for the EPA's selection of the Flower Gardens as an approved site for dumping oil company wastes is certainly justified. This is particularly true since it is

Marine Protection Research and Sanctuaries Act of 1972 and the Water Pollution Control Act Amendments of 1972. The published policy of the EPA under the law is, "to prevent or strictly regulate the dumping of any material in the ocean which would adversely affect human health, or the marine environment." But the EPA's actions have made a mockery of the laws it is charged with enforcing.

The EPA immediately proceeded to approve the Flower Gardens as an ocean dumping site for industrial chemicals and wastes — and by 1973 the *known* volume of these chemicals permitted to be dumped on the gardens had reached more than one million tons per year. It required a court-ordered challenge to bring the sordid story into the open, and public outrage forced the EPA to change its policy. (S.D. April, 1975.)

Yet the nagging questions raised by Nelson Herwig remain unanswered. Why were these tiny, unique reefs selected as an ocean dumping site in the first place? Why were chemical and other industries so willing, even eager, to go to the trouble and expense of shipping and barging their toxic wastes more than 100 miles offshore to an area far beyond the 12

miles that was then the limit of United States territorial waters? Why did the Texas EPA office cloak its ocean dumping permits in secrecy as closely guarded as the Watergate tapes? Why was the 1973 proposal of the Flower Gardens as a marine sanctuary opposed so violently by a powerful Washington lobby? Who were the sanctuary opponents that were never identified? Why has the 1977 renomination of the Flower Gardens as a marine sanctuary been delayed again, perhaps indefinitely? Why did oil company tankers often anchor over the Flower Garden reefs in order to pump out their tanks and clean their bilges?

The answers to these and other puzzling questions may never really be known, but they certainly suggest a carefully calculated and deliberate effort on the part of industry and governmental agencies to destroy the Flower Garden's coral reefs. This may sound incredible, but the attacks on these tiny reefs have been far too consistent and concentrated to be merely a coincidence.

The only reason for such a program that makes any sense is that the Flower Gardens sit on top of a salt dome of the type that virtually always spells riches for oil companies — because the most profitable and prolific oil and gas deposits are found beneath the periphery of such domes. Drilling operations in a marine sanctuary containing some of the nation's most valuable and unique coral reefs would have generated opposition and required the imposition of stringent measures designed to protect the reefs. But if the corals had been destroyed by chemical dumping the oil companies could claim they were simply drilling into a dead coral reef on an approved ocean dump site and the expense of protective regulations would have been avoided.

This is only supposition and, of course, cannot be proven. But the saddest part of the Flower Garden story is that the chemical dumping program almost succeeded in destroying the corals. As reported in the January, 1975 SKIN DIVER, the corals of the Flower Gardens consist primarily of brain (*Diploria*), star (*Montastrea*), and finger (*Porites*) corals which are normally rounded structures with a large, firm base. At the Flower Gardens, however, many of these coral formations are so badly eroded or eaten away around the base that they look like grotesque toad stools. Only the top portions of these weird, umbrella-shaped corals retain the familiar brain, star or finger convolutions from which they get their names. The entire supporting stem is dead and close examination of nearby rubble piles reveals the remains of similar stands that have collapsed from decay. These are personal observations made in 1974, but are supported by the University of Texas Research Center which states that about 70 percent of the corals

THE FLOWER GARDEN STORY

are dead. Additional evidence of damage from the chemical dumping is that abnormally high concentrations of toxic metals and persistent pesticides were found in the flesh of numerous species of fish and shellfish collected on the reef. A major contaminant found in fish such as grouper was mercury, the toxic metal that caused the infamous Minimata Disease that afflicted the Japanese people and created a worldwide panic.

Unfortunately, it is virtually impossible to legally prove that the chemical dumping caused the deterioration of the corals or the contamination of Flower Gardens fish because no studies were made of the conditions that existed prior to the dumping. But common sense points overwhelmingly in this direction. Particularly so now that the oil companies are demanding the right to drill near these reefs without taking any precautions whatsoever to protect the corals from the toxic wastes created by their operations.

The oil companies obtained their first lease to drill at the Flower Gardens around 1973 and 1974. In 1975 Mobil hit natural gas estimated at 90 billion cubic feet, and 23 more wells were drilled within the boundary of the proposed marine sanctuary which covers a four-mile radius around the gardens. These leases and drilling permits were issued by the

"The Flower Gardens have been a dumping ground for industrial chemicals since the 1960's. Among the deadly poisons dumped are insecticides, fungicides, acids, arsenic, lead, mercury . . ."

Bureau of Land Management (BLM) of the Department of Interior before the United States declared jurisdiction over the outer continental shelf out to 200 miles in 1977. This brought the EPA into the picture under Section 403 of the Clean Water Act which requires that permits for offshore wastewater discharges must comply with EPA Ocean Discharge Criteria as promulgated in 1979.

The EPA repeatedly warned the Department of Interior not to lease the Flower Garden tracts and that strict conditions would be imposed if such leases were granted. The BLM ignored the EPA's warnings and drilling leases were sold. Each lessee normally drills two to four exploratory wells and 40 development wells. There are 16 active leases near the Flower Gardens, which means a potential total of more than 600 wells.

The greatest hazards from drilling operations are the muds injected into the hole to flush out cuttings and serve as a lubricant. These muds vary widely in composition, but all contain chemical constituents such as bactericides, corrosion inhibitors, defoamers, emulsifiers, flocculents, foaming agents, shale control inhibitors, surface active agents, viscosifiers and weighting agents — plus a wide variety of toxic metals such as mercury, cadmium, arsenic, cyanide, copper and others. More than 1000 chemical compounds can be contained in drill muds and very few have ever been tested for their impact on marine life.

According to an EPA 1979 public notice, a 10,000 foot well will dump around 7000 barrels of mud and cuttings in the first 1000 feet, plus up to 7000 barrels of mud and 4000 barrels of cuttings (with adhering mud) for each well. The total for each lease tract will range up to 616,000 barrels of mud and up to 172,000 barrels of cuttings.

The EPA originally recommended that these wastes be either barged to shore or piped well out into the gulf in order to ensure protection of the garden corals. But the oil companies squawked that the extra cost would make their operations unprofitable — and the EPA backed down, even though oil company profits in recent years have been so high they are labeled "obscene."

The restrictions now proposed by the EPA are almost the same as those recommended by the BLM and have been termed "asinine" by respected marine biologists. The BLM requires that muds and cuttings be shunted to the bottom where they claim a nepheloid layer will hold them there forever. The EPA went a little farther and required muds to be discharged four miles away from the coral reefs, but the cuttings and adhering muds can be shunted within 10 meters of the bottom at 100 meter depths. This is the "crinoid zone" where these feathery sea creatures thrive.

EPA regulations rely heavily on the discredited dispersal and dilution formulas to take care of sewage, garbage and platform wastewaters washed off during operations. The requirements here are simply that these pollutants be released far enough beneath the surface to be unseen. In other words, the old out-of-sight, out-of-mind hypothesis.

(Continued on Page 58)

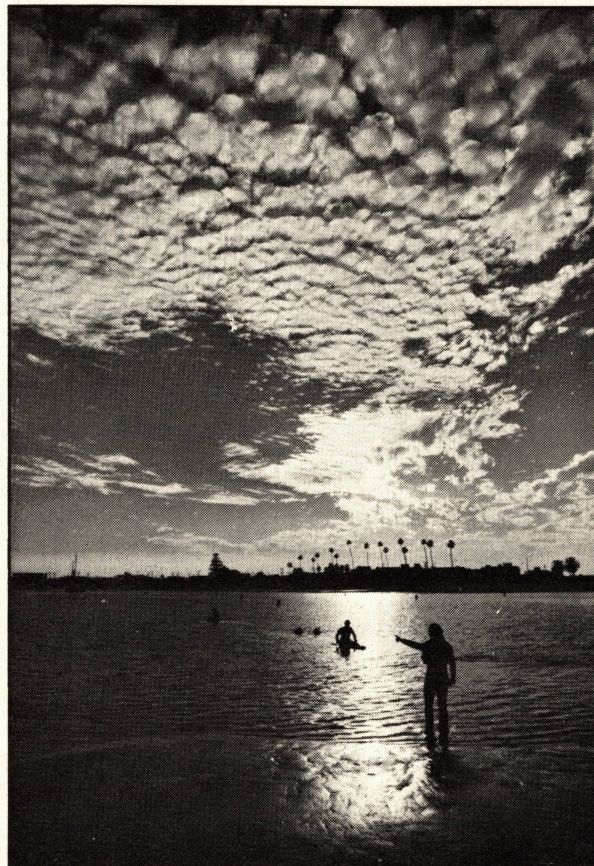
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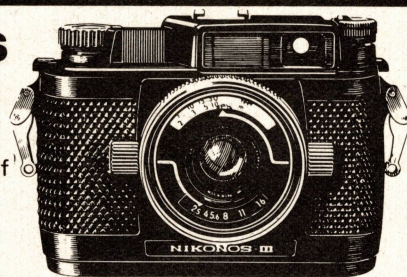
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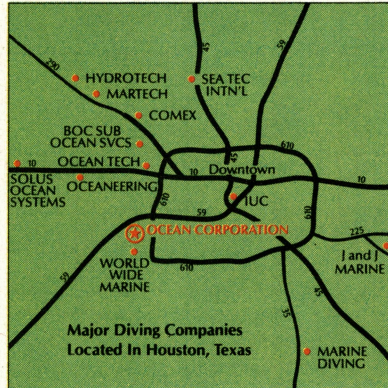
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BECAUSE

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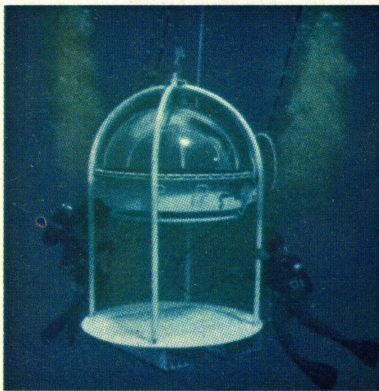
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BECAUSE

The Ocean Corporation management and instructor staff have long-term experience in the international offshore oilfield diving business. Retired ex-military divers and sport scuba divers don't run the school... commercial divers do. For example, the President of The Ocean Corporation, Larry

Cushman, was Vice President and Europe/Africa Area Manager for Ocean Systems, Inc. for three years... with responsibility for all North Sea diving and underwater construction operations. He also worked six years as a manager for Oceaneering International, Inc., another of the world's largest commercial diving contractors. Ocean Corporation managers and instructors know today's diving business... first-hand, from recent experience.



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Abalone:

top sirloin of the sea

By Jennie March

Aristotle called these creatures "wild limpets." For centuries the *awabi* has been a great delicacy in Japan. In other parts of the world this gastropod has been dubbed *paua*, *mutton fish*, *perlemeon*, *senoritas*, and *aulone*. In California the abalone has typically been diminished by American slang to become just an *ab*; but even so it is still a gastronomic treasure to many local divers along the Pacific coast. For the diver who likes adventure, a visit to California would not be complete without an *ab* dive.

There are 130 species of abalone worldwide, seven of which inhabit the California coast. Whites (*Haliotis soredensis*), reds (*Haliotis rufescens*), pinks (*Haliotis corrugata*), greens (*Haliotis fulgens*), and blacks (*Haliotis cracherodii*) are the most common species of abalone found on the Pacific coast although various crossbreeds do exist.

Before the turn of the century, California had a reputation as one of the most heavily populated abalone areas in the western hemisphere, but the popularity of this snail since the late 19th century has depleted the stock considerably. The California Indians were the first to gather the *abs* along the shores and shallow eddies and were the first to introduce them to the European settlers. The Chinese and later the Japanese and Americans successfully harvested huge quantities of abalone for commercial reasons, thus altering the natural state and environment of these asexual creatures to the point where they had to be put under the protection of California state law.

Aside from its human predator, the Pacific coast abalone has also been exposed to the prodigious appetite of the Pacific sea otter. Protected by the 1972 Marine Mammals Act, sea otters have flourished and threaten the existence of the abalone, one of their favorite foods. Sea Otters consume up to 25 percent of their own body weight in seafood per day, and have been known to eat as much as 15 pounds of shellfish. The thriving sea otters have literally eaten their way down the coast of California from Monterey County past Morro Bay on the

way to Santa Barbara and have wiped out whole areas where abalone once prospered. It is not uncommon to see these clever animals floating among the waves and kelp beds on their backs devouring the meat of an abalone. With a growth rate of one inch per year, *abs* are no match for ever-hungry sea mammals.

To protect these mollusks from the sport diver, the California Fish and Game Laws have set a few guidelines for anyone interested in hunting abalone. For the sport diver wanting to collect *abs* there are a few details that must not be overlooked. The California abalone diver must have:

1. A California fishing license; these can be bought for approximately five dollars at sporting good stores.
2. An *ab* iron. The *ab* iron is a piece of metal with no sharp edges that must be $\frac{3}{4}$ " wide, $\frac{1}{16}$ " thick, and at least 18" long. They are available from dive shops for about five dollars.
3. Knowledge of the California Fish and Game Laws which are just a few basic rules about when and how the abalone can be collected.

The optional, but recommended, equipment for any *ab* dive off the California coast includes a goodie bag. Gloves are also a good idea when handling these mollusks because of the sharp crustaceans which grow on the shell.

The scuba diver has been restricted to the southern part of California south of Yankee Point in Monterey County. North of this point abalone may only be taken by skin divers as the *abs* are found in much shallower waters. The California Fish and Game Law says that no person can have in his possession more than four *abs* on any one day dive trip. The minimum legal length for abalone is seven inches for reds; six inches for whites, greens and pinks; five inches for blacks; and four inches for any other *ab* species.

North of Yankee Point the abalone season is during the months of April through June, and August through November. South of Yankee Point abalone may be taken from March 16 through January 14.

The only exceptions to this are on parts of Catalina Island and between Palos Verdes Point and Dana Point near Los Angeles. Any infringement on these laws can cost the diver up to \$500.

To the inexperienced *ab* diver this may all seem like too much trouble just for an abalone, but once you know the rules the *ab* hunt becomes an exciting challenge.

Contrary to the usually warm weather in the interior inland areas of California, the temperature of the Pacific on the West Coast is deceiving. A one-quarter inch wetsuit is necessary for even the heartiest cold water diver and for the abalone diver spending a few hours in the water a wetsuit is a must. Once you have all the equipment together, all you need is determination and a little patience to have a successful *ab* dive.

Abalone can usually be found attached by their muscular foot to a rock or under rock ledges. The experienced *ab* veteran can spot an abalone without much trouble, but the novice might have difficulty telling the *ab* from the rock it is on. The best trick is not to focus on finding the shell, but to look for the gastropod's moving mantle which protrudes out from around the shell.

Once the diver has found an abalone, the next step is to measure the length of the shell to make sure it is not a "short." Shorts are those abalone of less than the minimum legal length. Detaching this creature from its rock can be more difficult than it sounds, as some say *abs* have a suction force equal to 400 pounds. This is where an *ab* iron helps. When placed between the *ab* and its rock the iron should give enough leverage to overpower the *ab*'s suction force. One quick shove and the creature will come off the rock unharmed.

Abs are vegetarians and usually live in rocky bottomed kelp areas.

Californians believe that abalone are a unique delicacy tasting like nothing else that comes from the ocean. Sliced into thin steaks, pounded until lace-like in appearance, sauteed for less than a minute per side in butter and served with white wine, they are sirloin of the sea. 

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TEXT AND PHOTOGRAPHY
BY MARTY SNYDERMAN



DIVE GLOVE *Roundup*

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Harvey's, NT 901L, NT 902L



Harvey's, NT 802L, NT 803L



Harvey's, TS 802L, TS 803L

Swimming along the top of Grand Cayman's famous North Wall, I was hoping to find an octopus to photograph. As always, the reef was colorful, and alive with nocturnal creatures. I remember seeing a spotted moray, brittle stars covering several sponges, and the highly reflective eyes of numerous shrimp. I really didn't take the time to stop and admire, or even photograph any of those animals, because I had another purpose. I wanted a picture of an octopus and was determined to get one that evening. About 500 pounds into my dive I found not one, but two, octopi moving along the reef. Trying to focus, I pointed my light at the closest one and saw it magically change color from a light brown to a bright turquoise. Everything was perfect — I remember feeling so smug. Keeping my eye glued to my viewfinder, I tried to brace myself on the reef. Ouch! Instant fire! I jumped forward, kicking up the bottom, which in turn scared both octopi deep into nearby crevices. I had placed my hand on top of fire coral and my bare right hand was suddenly burning as if I had lit a box of matches and held onto the box. Obviously, I did not get the octopus photograph that only moments before I was sure would be a prize winner. Instead, I ended up with a hand that looked like it had an advanced case of measles. Red welts and itching were soon to follow. Worse yet, to this day my photographic library still lacks a picture of a bright blue Caribbean octopus. As a California diver, I was guilty of thinking that in Grand Cayman, I was in warm tropical water and I had no use for gloves. My dive certainly would have been more pleasant if I had been wearing the right pair of gloves instead of diving without any.

A little smarter about my dive needs than before that night dive, but unfortunately not smart enough, I returned the next week to my home in San Diego. I was looking forward to getting back into the kelp forests of Point Loma with my dive buddies. Only a few days later, we were off to the kelp beds. It was a beautiful spring day in early June but dive conditions were truly unusual for Southern California. We dove in an extremely strong thermocline and water temperature along the bottom at a depth of 90 feet was only 42°F.

Settling on the bottom I was aware that visibility was at least 40 feet and we had picked a beautiful reef to dive on. Several cooperative gopher rockfish posed for me on the anemone-covered walls of the reef, but after a few minutes my hands became so cold they began to hurt. Only a few minutes into my dive my hands hurt so badly that I wasn't having any fun. I kept hoping that someone would run low on air or want to go back to the boat, but my buddies were having a great time photographing cooperative rockfish. Finally we returned to the boat, where, while trying to warm my hands, I took a

look at my gloves. They were several years old, full of holes, and should have been replaced long ago.

As with most dive equipment, there are both regional and personal preferences to consider when selecting gloves. In Ft. Lauderdale I learned to dive with a pair of cotton gloves; now in California I have a pair of 1/8 inch neoprene gloves, a pair of 1/4 inch neoprene mitts, and a pair of leather gloves for lobster diving. The difference in the gloves needed by lobster chasers or spearfishermen diving in the same area of the Channel Islands can be as different as the gloves needed by sight-seers in Hawaii and wreck divers in the Great Lakes. And even photographers in the same area might choose to use different gloves as a matter of personal preference. In colder waters, novice photographers will probably want all the dexterity they can find in a pair of gloves, but will still want a pair which will keep them sufficiently warm.

While photographers need gloves which will protect them as they push levers and turn knobs, spearfishermen need gloves which will assist them in gripping a pole spear, loading a speargun, or bagging their catch; as well as providing some protection. After only a few minutes in the water hands become rather soft, but the spines of a speared fish remain as sharp as ever. Shell collectors, on the other hand, need gloves which afford all the dexterity required to pick up the tiniest of shells; while wreck divers need durable gloves which offer protection from the sharp surfaces found on wrecks. And too, fish collectors, fish feeders, and abalone divers all require different styles of gloves to enable them to enjoy their favorite underwater activities.

Gloves are by no means only a cold water consideration, although the specific gloves needed by cold water divers of the New England area can be quite different than those for Hawaiian divers. Visitors to tropical water might not need much thermal protection, but they certainly need protection against physical contact with certain plant and animal life.

A quick look into the dive bags of the best underwater photographers will often reveal six or eight pairs of gloves in different sizes and colors for their models. They will never be in the position of having to photograph a red cleaner shrimp on a red glove, a black crinoid on a black glove, or encounter the exposure problems presented by trying to capture the detail of a dark starfish held in a light colored palm.

Different styles of gloves serve a number of diverse purposes which in some way make your dives more pleasurable. All gloves offer protection of some sort; whether it be the avoidance of cuts or painful stings, or defense against cold water. Neoprene gloves are especially designed to offer thermal protection, while other styles are best suited as an



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Henderson Aquatics, Inc., G4-2



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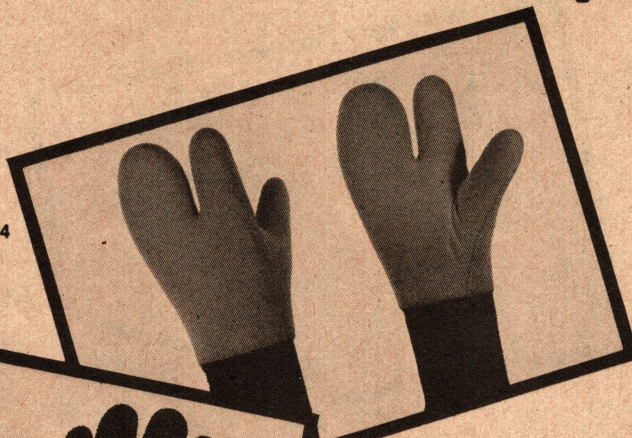
Imperial Mfg., 255



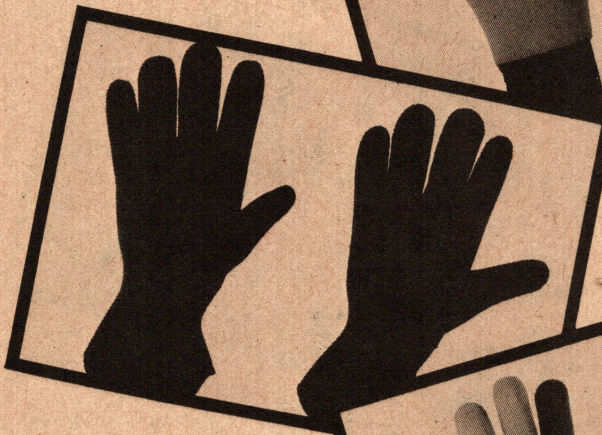
Imperial Mfg., 252-253

DIVE GLOVE *Roundup*

Imperial Mfg., Dry Mitt, 254



International Divers, Inc., 1791



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Parkway Fabricators,
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Parkway Fabricators,
AMC121-AMO131



Scubapro, 58-475-100—58-475-500



aid to a particular task. Many spearfishermen like to use gloves with roughly finished vinyl or rubber palms to gain a better grip on their spears when the sling is cocked. Spearfishermen who use guns still need protection against the sharp spines and gill plates of big fish. Shell collectors often prefer gloves with a textured finish that helps them pick up small shells. For those who are style conscious, there is a variety of designs, colors, and styles to complement any outfit. After all, dive equipment is becoming more and more style conscious every year and even if you aren't a photographer's model there is no reason your gloves shouldn't add a little pizzazz to your looks. Whether you are trying to take a photograph, bag a bug, spear a fish, model, dive a wreck, there are gloves that can help you accomplish your task.

As with most dive equipment, some trade-offs need to be considered before buying gloves. Keep in mind that the gloves that are right for other divers might not be those that are right for you. It is not fair to expect one pair of gloves to do it all; offer the greatest dexterity, the best thermal protection, the brightest colors, the most assistance in all underwater tasks, and be the most durable. Using any type of glove might cost you some dexterity and sense of touch, but is having maximum dexterity more important than comfort and warmth? And be aware, cold bare hands have less dexterity and strength than warmer hands inside a neoprene glove or mitt.

NEOPRENE GLOVES

The dive gloves most commonly used by sport divers today are neoprene and non-neoprene. There is one major reason that divers prefer neoprene gloves or mitts to non-neoprene products — that is the thermal protection provided by neoprene rubber. Tests from the Naval Medical Research Institute have determined that human hands work best at a skin temperature of 83.4°F with some minor deviations. Hands are, however, an area of the body that most quickly approaches ambient temperature, especially in conditions where surrounding temperatures are cooler than body heat. The human body is designed to be much more concerned with survival than with comfort, and is therefore more concerned with core temperature than with skin temperature. In colder environments the body will cut off some circulation to the extremities in order to maintain vital core temperature. For the hands of sport divers that can cause some minor problems, most of which can be overcome by wearing a good fitting pair of neoprene gloves or mitts. Whether you choose gloves or mitts is a matter of personal preference which can be influenced greatly by water temperature and your activity for the day.

Neoprene rubber is a synthetic that is either gas blown or chemically blown. It

provides protection by trapping a layer of water between the rubber and your skin and using your body's heat to warm the water.

Neoprene gloves and mitts for sport divers are generally made in three thicknesses; $\frac{1}{8}$ inch, $\frac{3}{16}$ inch, and $\frac{1}{4}$ inch. The thicker the rubber, the warmer the glove or mitt, but this is not always the case. Other factors, such as construction and fit, are also very significant. Neoprene that is extremely pliable will compress more easily under pressure at depth, and gloves made of this pliable rubber can be significantly thinner at depth — thus offering less warmth than a pair of gloves made of a thinner layer of neoprene which doesn't compress as readily. However, your hands do have a better chance of staying warm in a pair of gloves or mitts made of thicker rubber rather than thinner rubber if all other factors, such as fit and construction, remain the same. The trade-off for the additional warmth provided by using thicker neoprene is usually a loss of dexterity and sense of feel. Commercial divers who dive in extremely cold water for extended periods of time often use gloves that are $\frac{3}{8}$ inch thick; but gloves that thick are strictly for divers working in very deep, cold water, and often require at least two people to put them on and enough pressure at depth to compress the gloves enough to allow dexterity.

Neoprene rubber by itself is not very durable. In order to increase the durability of neoprene rubber products, manufacturers have learned to protect the rubber by adding a thin layer of nylon or Lycra to the rubber. The nylon or Lycra is a coating layer affixed to the rubber with an adhesive spray. Whether protected by one layer of nylon or Lycra and referred to as nylon one or Lycra one gloves or mitts, or protected on both sides and referred to as nylon two or Lycra two, the price you pay for the added durability is usually a little less dexterity, a little less warmth on the surface due to evaporation, and a little more money.

Another reason that manufacturers add nylon to gloves is because when wet, neoprene products that are not nylon or Lycra backed can be difficult to put on — as raw neoprene has a tendency to stick to your skin. Some gloves are, however, made with one layer of nylon on the outside of the glove and neoprene on the inside; gloves made in this manner are extremely comfortable.

Lycra, a relatively new product in the dive field (except for use as swim suits), is more flexible than nylon because it stretches easily in two directions while nylon stretches in only one. Some divers prefer the added elasticity offered by Lycra.

Diverse colors of nylon are also a factor in considering the manual dexterity you expect from your gloves. Black nylon provides the most dexterity because the



Scubapro, 58-010-200—58-010-500



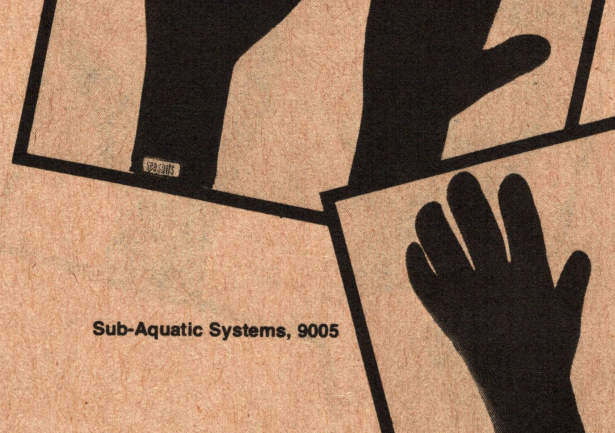
SeaSuits, G-1, G-2



SeaSuits, G-3, G-4



SeaSuits, M-1, M-2



SeaSuits, M1-1, M2-2



Sub-Aquatic Systems, 9005

DIVE GLOVE *Roundup*

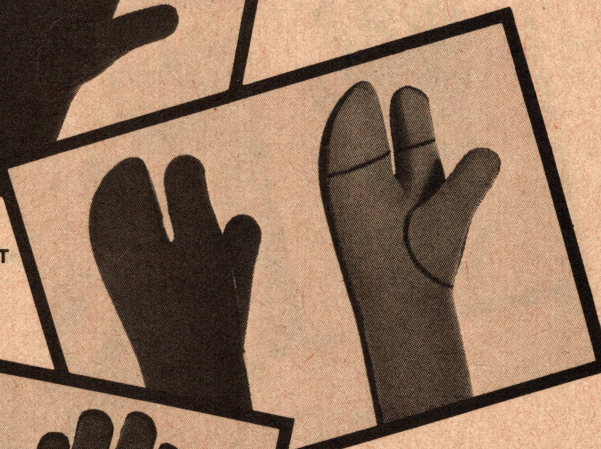
Sub-Aquatic Systems, 9006



Sub-Aquatic Systems, 9008



Sub-Aquatic Systems, 9007, 9007-T



U.S. Divers, G-93



U.S. Divers, G-95



White Stag, 54951



least amount of dye is used, and blue nylon is a close second. Other colors, such as orange and red, require considerably more dye and the additional dye reduces the elasticity of the nylon. It is the nylon, not the rubber, that loses its elasticity — but nonetheless your orange or red gloves will offer less dexterity than will black or blue gloves made of the same thickness of neoprene and similarly designed. Red or orange gloves can, however, add quite a bit of aesthetic appeal to a photograph, and can provide added safety on the surface owing to their high visibility.

Studies conducted at UCLA have shown that hand strength is reduced by 22 percent when wearing a pair of $\frac{1}{8}$ inch nylon two gloves because of the reduced ability to grip due to the loss of friction between your hands and the object. Some manufacturers offer both a textured nylon or a textured rubber out, nylon in, nylon one glove or mitt to increase the friction.

CONSTRUCTION

There are a number of ways to construct neoprene gloves or mitts. Some methods provide extra warmth, others emphasize flexibility or durability, and some are simply less expensive. The simplest process is to cut two pieces of rubber from a traced pattern shaped like a hand and sew the two pieces together. This method requires the least amount of work and materials, so these gloves are usually the least expensive. However, gloves produced in this manner have more excess material in the seams and, therefore, offer a restricted sense of touch. Seams that are only glued allow your hands to stay warmer than do styles with seams sewn all the way through because cold water tends to penetrate these gloves along the thread line. Gloves or mitts with glued seams, however, are not as durable as gloves with both sewn and glued seams, and a glued only glove or mitt will probably require more maintenance. Neoprene products can only be sewn together if they are nylon or Lycra backed because it is the nylon or Lycra from one piece of rubber that is sewn to the nylon or Lycra from another; not neoprene sewn to neoprene. Most threads will quickly cut through neoprene alone. Some gloves are both glued and sewn with the entire seam glued and only one side sewn. A glove or mitt made in this fashion offers almost as much warmth as a glued only glove and nearly the strength of gloves or mitts with sewn through seams.

In addition, the type of stitching along a sewn seam is an important factor in durability. Heavier grades of thread can add to the durability of a glove, and any type of interlocking or overlock stitch is more durable than a straight stitch with the same grade of thread.

Some manufacturers add a protective layer of finish over their seams. Usually somewhat elastic in nature, the finish will

help keep the seam as dry as possible as well as protect it.

Some neoprene gloves and mitts have a separately sewn thumb pocket, while others simply match two pieces of material together. Like a palm seam, which is located at the top of the palm and the bottom of the two middle fingers of your hand, the thumb seam will help take up excess material.

Tapering the glove at the wrist to fit the contour of your body and to keep excess water from entering your glove is a design idea used by several manufacturers. Once the glove is on your hand such a design can be an excellent feature, but it can be difficult to squeeze a large hand through a tapered wrist.

Past the wrist toward your forearm, designs vary considerably. Most gloves and mitts are cut straight back, but some flare out to accommodate the contour of your forearm. This flare allows the glove to fit easily over your suit. Most of the flared models flare only enough to allow a comfortable fit over your suit, but some flare so much you can wear your dive watch underneath them. The construction of some gloves, especially $\frac{1}{8}$ inch and $\frac{3}{16}$ inch thick models, includes the feature of edge trim, sometimes called over-edge stitching. This feature involves sewing a seam or protective layer on the edge of the cuff to prevent fraying.

I cannot tell you which pair of neoprene gloves or mitts is best for you, but I can explain how they should fit if you're concerned with thermal protection. First, your gloves should be comfortable. The design should fit the natural contour of your hand so you do not feel as if you are fighting your equipment, but instead have simply placed your hand inside of it. The seams should not irritate your skin even after the gloves have been worn awhile. The less excess material in your fingers, both in length and in diameter, the better your sense of touch and in the case of neoprene products, the warmer your hands. The individual finger and thumb pockets should closely correspond to the shape of your hand so that the glove or mitt will bend where you want it to bend. The finger pockets should therefore bottom out close to the top of your palm. The tighter the fit, as long as your hands remain comfortable, the better the fit.

MITTS

Gloves, as opposed to mitts, have five individual finger pockets for your fingers and thumb, while mitts have three pockets. Mitts have one pocket for your thumb, one for your index finger, and one for the remaining three fingers to fit into collectively. Mitts are generally thought to be warmer than comparably made gloves for several reasons. First, the bunching together of three fingers into one pocket conserves body heat. In a properly fitting mitt there is less water for the three fingers to warm up in one pock-



White Stag, 54952



White Stag, 54956



White Stag, 54957



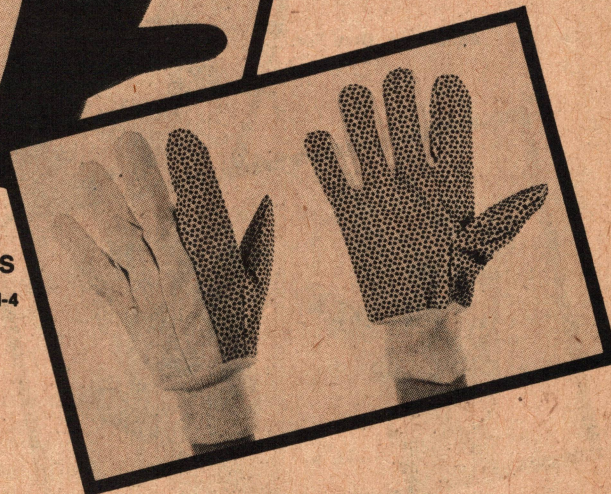
White Stag, 54959



White Stag, 54982

NON-NEOPRENE GLOVES

Aqua-Craft, Black Dot, H-3, H-4

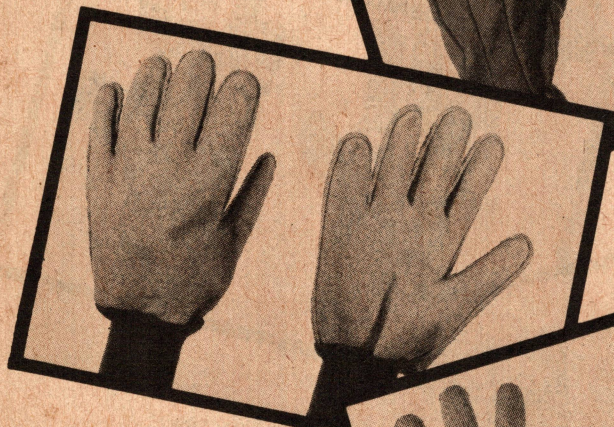


DIVE GLOVE *Roundup*

Aqua-Craft, Reef Gloves,
H-6—H-9



Aqua-Craft, Aqua Sensor,
H-24—H-26



Aqua-Craft, Super Dex,
H-47, H-48



Aqua-Craft, Hunter, H-66—H-68



Aqua-Craft, Dive Rite,
H-69—H-72



Global Mfg., Co., 371



et, than there would be in the separate pockets of a glove. Second, mitts help your hands maintain their heat because a flat surface of neoprene rubber will not conduct heat away from your body as rapidly as a curved surface. Although mitts can provide more warmth, they generally provide less dexterity than gloves.

CARE

Whether you decide upon mitts or gloves, you can increase the life of your neoprene products with a little tender loving care. When putting on your gloves or mitts it is best to slide your hands and fingers in as far as they will go without grabbing the rubber and pulling it on in a forceful manner. Forced pulling will stress the seams and cause leaks and tears. The same principle is true when removing your gloves. It is better to slowly work the glove off by alternately pulling the entire length of each finger pocket in a gentle manner, than to grab the end of one finger and pull.

However you decide to put your gloves on or take them off, a little care will place less stress on the seams and will greatly add to your glove's life. If you do tear your gloves, a little neoprene cement and the right technique can go a long way in repairing them. Proper technique is needed and if you are uncertain about the use of neoprene glue, I would suggest a trip to your local dive shop — the same applies to an unraveling seam.

After dives, your gloves or mitts should be washed in fresh water as soon as possible and laid flat or hung to dry. This should be done as soon as possible to avoid bacterial buildup and unpleasant odors. Drying should take place out of direct sunlight, and both the inside and outside of the glove should be dried. Once dry, neoprene products should be stored in a cool, dry place out of direct sunlight or heat, and hung or laid unfolded and uncreased in your gear bag. Remember, neoprene products can break down rather quickly when exposed to heat, sunlight, ozone or other pollutants, or when folded.

NON-NEOPRENE GLOVES

The variety of non-neoprene gloves available today is almost as large as the variety of neoprene products, even though only three manufacturers distribute non-neoprene gloves. When I arranged the gloves on my living room floor I was surprised by the array of materials, colors, and designs. These gloves come in many materials from vinyl impregnated, to pigskin, to cotton, to tafetta. Some have long cuffs that extend to mid-forearm, while others have no cuff at all. Still others have knit cuffs or an elastic closure at the wrist. And the colors vary from tan, to dark green, to bright orange, and stylish combinations.

Like neoprene gloves and mitts, non-neoprene gloves offer protection, al-

though it is not primarily thermal protection. Even the thinnest pair of gloves will prevent the stinging cells of most marine creatures from irritating your hands. Almost all non-neoprene gloves are used in warm water where thermal protection is not a major consideration, but there are exceptions to that rule. Even in non-tropical areas, some divers, such as serious abalone divers, prefer the protection and grip assistance offered by vinyl impregnated gloves or heavy leather gloves to that of neoprene gloves or mitts. Reaching into crevices and prying abalone off rocks can be tough on water softened hands, especially knuckles. Neoprene gloves and mitts cannot stand up to the constant abuse of such use, and ab divers certainly need some protection. And, the sandpaper-like finish of vinyl impregnated gloves assists abalone hunters in handling their catch. Lobster divers require special protection against the spines of large bugs and for that reason they often wear thick leather or pigskin gloves. When the lobster are found to be gathering in cold water, some bug divers like to wear extra large leather gloves over their neoprene pair. Often cold water wreck divers employ this same technique, as the sharp surfaces found on wrecks can tear up a pair of neoprene gloves in just a few dives. And spearfishermen too, need all the help they can get to keep from cutting their hands on sharp fish spines. They often prefer the rubber impregnated or vinyl impregnated gloves with rough textured finishes for protection as well as help in holding a cocked sling, loading a gun, or quickly bagging their fish.

Shell collectors, photographers and models often prefer to have the most dexterity that gloves can provide as long as thermal protection is not important. As with neoprene gloves and mitts, the less excess material in the seams, palm, and fingertips, and the closer the glove fits to the natural shape of your hand, the more manual dexterity you have. Even though non-neoprene gloves are not nearly as thick as neoprene products, sense of touch and ability to manipulate small knobs on cameras or pick up shells is greatly influenced by the thickness of the glove, the material used, and the exterior finish on the front of the hand.

Surprising to me was the fact that a variety of exterior finishes, from plastic dots on cotton surfaces, to pigskin, to vinyl, can be made so that excellent dexterity is provided. We found the results from trying to pick up a marble and a pen off of the table to be the same as when we tried this at the bottom of the pool. This finding is in line with Navy studies that prove divers generally use their hands underwater the same as they do on land. Navy studies have also demonstrated that as far as manual dexterity is concerned, there is a strong underwater learning curve; meaning that tasks involving dexterity are performed with much greater



Global Mfg., Co., 375-377

Global Mfg., Co.,
Green Snorkel, 378



Global Mfg., Co., 380



Global Mfg., Co., 381, 383, 384



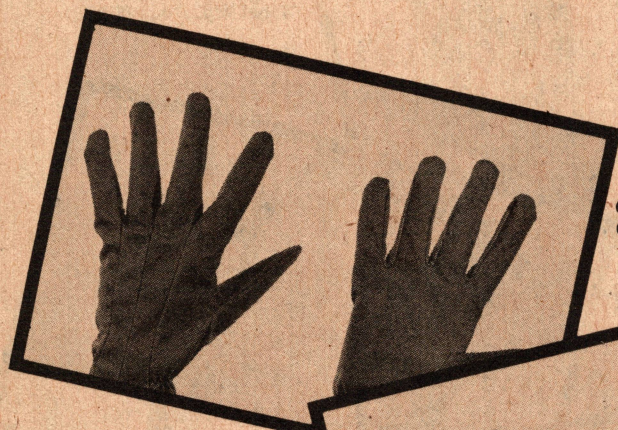
Global Mfg., Co., 385



Global Mfg., Co., Grab It, 386



DIVE GLOVE *Roundup*



Global Mfg., Co.,
Camera-Ski-Golf Glove, 387



Global Mfg., Co., Tuf-Duck, 388



Sport Divers Mfg., 20-102, 20-103



Sport Divers Mfg., 20-105



Sport Divers Mfg.,
Super Flex, 22-515, 22-516

proficiency after only a little practice. So, if changing apertures on a Nikonos or picking up small shells was a little frustrating the first time you tried it, stick with it. Also, if dexterity is important to your needs, I'd suggest that when you pick out a pair of gloves you try them on in your local dive store and then attempt to pick up a couple of small objects off a hard surface to see which pair works best for you. While some dive equipment needs to be tried out in the water, the Navy studies indicate that gloves can be adequately tested on land. Be sure not to use an easily pliable surface, like a carpet, because it is easy to accidentally mash down the carpet and force the test object up into your hand. Additionally, the hard surface will better simulate the reefy bottom terrain found in most dive areas.

Many of the non-neoprene gloves with textured finishes, such as impregnated vinyl, will enable you to gain a stronger grip when using your entire hand for gripping — as you might when prying with your dive knife or grabbing a scallop. Gripping with your entire hand is significantly different than gripping with just your fingertips. Some of the impregnated and coated gloves are thicker than other styles, and while the thicker gloves will prove to be more durable, they cannot provide the sense of touch given by thinner models of impregnated or coated gloves — such as Sport Divers' super flex or Global's vinyl coated knit lined number 380 gloves. The choice of durability versus dexterity is one you can best make for yourself.

For photographers and the special needs of their models, and for anyone who is interested in adding a little color to their dive gear, the variety of colors in non-neoprene gloves is excellent. The bright orange of Aqua-Craft's reef glove and Global's 387 can add that special touch of color. Colors can provide the contrast necessary for hand held macro subjects.

The fit of non-neoprene gloves is not as critical as it is with neoprene models because the glove is not used primarily for thermal protection, but your comfort is every bit as important. When selecting your gloves for tropical water diving, be careful that interior seams and any excess material do not irritate your hands. Additionally, some gloves have an open cuff or no cuff, while others have a form fitting knit cuff or an elastic or velcro closure at the wrist. These cuffs will help prevent sand, mud, or small pebbles from getting inside your glove. Elastic materials, which provide the tightest and most comfortable closures, do not, however, hold up for long periods of time in salt water like a velcro band will. But velcro closures are not as form fitting.

For added comfort, many of the vinyl impregnated models and others with textured finishes have an internal cotton or

DIVER'S GLOVES REFERENCE CHART

COMPANY	MODEL #	THICKNESS/ MATERIAL	CUFF CONSTRUCTION	SIZES	COLORS	SEAM CONSTRUCTION	SPECIAL FEATURES	PRICE
AQUA-CRAFT 7992 Miramar Rd. San Diego, CA 92126	Gloves							\$ 2.50-
	H-3, H-4	Cotton	Elastic knit	S,L	White/black		Black plastic dots	2.75
	H-6 thru H-9	Vinyl	Elastic band	S,M,L,XL	Orange			6.95
	H-24 thru H-26	Vinyl over stretch fabric	Elastic knit	S,M,L	Tan, brown cuff			4.95
	H-32 thru	3/16", NP/N2*	Flared	S,M,L,XL	Blue, orange	Glued & sewn	Tapered wrist: palm, thumb seams, reversible	23.00
	H-34 & H-56						Rubber coated	3.50
	H-47, H-48	Cotton	No cuff	M,L	Beige		Vinyl cover	4.00
	H-66 thru H-68	Cotton	Elastic knit	S,M,L	Tan, white cuff		Elastic band, velcro closure on wrist	8.95
	H-69 thru H-72	Nylon/taffeta	Edge trimmed	S,M,L,XL	Gray & red			
	Gloves							
BAYLEY SUIT, INC. 900 S. Fortuna Blvd. Fortuna, CA 95540	H-76 thru H-79	1/8", NP/N2	Flared	S,M,L,XL	Blue, orange	Glued & sewn	Tapered wrist: palm, thumb seams	19.95
GLOBAL MFG. CO. P.O. Box 15307 Milwaukee, WI 53215	Gloves							
	0-20-31	1/8", NP/L2	Stretch trim	XS,S,M,L,XL	Black, blue, red, tangerine	Glued & sewn		32.00
	Mitts							
	0-20-24	1/4", NP/L2	Stretch trim	XS,S,M,L,XL	Black, blue, red, tangerine	Glued & sewn	Two-color mitt may be ordered	31.00
	371	Pigskin	Pigskin	S,M	Green		Adjustable wrist strap	6.95
	375 thru 377	Pigskin	Trimmed edge	S,M,L	Yellow		Vinyl coated	4.95
	378	Stretch fabric	X-long gauntlet	S,M,L,XL	Light green, dark green cuff		Vinyl coated	3.50
	380	Knit lined	No cuff	M,L,XL	Tan		Vinyl coated	4.50
	381, 383, 384	Cotton	Elastic knit	Women's M	Beige			
				Men's M,L				
HARVEY'S 2505 S. 252nd St. Kent, WA 98031	Gloves							
	NT 901L	1/8", NP/N2		XS,S,M,L,XL	Black	Sewn	Palm seam	20.00
	TS 901L	1/8", NP/N1		XS,S,M,L,XL	Black	Sewn	Palm seam	16.00
	NT 902L	3/16", NP/N2		XS,S,M,L,XL	Black	Sewn	Palm seam	22.00
	Mitts							
	TS 802L	3/16", NP/N1	Flared	XS,S,M,L,XL	Black	Glued & sewn	Textured neoprene exterior, thumb seam	18.00
	TS 803L	1/4", NP/N1	Flared, edge trimmed	XS,S,M,L,XL	Black	Glued & sewn	Textured neoprene exterior, thumb seam	22.00
	NT 802L	13/16", NP/N2	Flared	XS,S,M,L,XL	Black	Glued & sewn		22.00
	NT 803L	1/4", NP/N2	Flared, edge trimmed	XS,S,M,L,XL	Black	Glued & sewn		26.00
HENDERSON AQUATICS, INC. Buck & Sassafrafs Sts. Millville, NJ 08332	Gloves							
	G1-2	1/8", NP/N2	X-long, flared	XS,S,M,L,XL	Black	Glued & sewn	Three coats of glue used, end of seam sealed	23.95
	G3-2	3/16", NP/N2	X-long, flared	XS,S,M,L,XL	Black	Glued & sewn		25.95
	G4-2	1/4", NP/N2	X-long, flared	XS,S,M,L,XL	Black & blue	Glued & sewn	1/8" neoprene between fingers	30.95
	Mitt							
IMPERIAL MFG. P.O. Box 4119 Bremerton, WA 98319	DM 4-2	1/4", NP/N2	1/8", N1	XS,S,M,L,XL	Black	Glued & sewn		24.95
	Gloves							
	220	1/8", NP/N2	Edge trimmed	XS,S,M,L,XL	Black, blue, or orange	Sewn	Palm seam, available in textured nylon	22.10
	255	3/16", NP/N2	Edge trimmed	XS,S,M,L,XL	Black	Glued & sewn	Tapered wrist, palm, thumb seam	22.10
INTERNATIONAL DIVERS, INC. 13659 E. Rosecrans, Santa Fe Springs, CA 90670	Mitts							
	252	3/16", NP/N2	Edge trimmed	XS,S,M,L,XL	Black, blue, or orange	Glued & sewn	Thumb seam, available in textured nylon	25.05
	253	1/4", NP/N2	Edge trimmed	XS,S,M,L,XL	Black, blue, or orange	Glued & sewn	Thumb seam, available in textured nylon	25.60
	254	1/4", NP/N2	Edge trimmed	XS,S,M,L,XL	Black, blue, or orange	Glued & sewn	Cuff is 1/8" rubber in, nylon out seal, available in textured nylon	28.50
O'NEILL, INC. 1071 - 41st Ave. Santa Cruz, CA 95062	1791	1/8", NP/N2		XS,S,M,L,XL	Black	Glued & sewn	Palm, thumb seam, tapered wrist	19.95
	Gloves							
		3mm, NP/L2		S,M,L	Blue/black	Glued & sewn	Contoured to fit relaxed hand	30.00
PARKWAY FABRICATORS 241 Raritan St. South Amboy, NJ 08879	Gloves							
	AGC121	3/16", NP/N2	Edge trimmed	XXS,XS,S,M,L,XL	Black	Glued & sewn	Thumb seam	24.50
	Mitts							
	AMC121	3/16", NP/N2	Edge trimmed	S,M,L,XL	Black	Glued & sewn	Thumb seam	21.90
	AMQ131	1/4", NP/N2	Edge trimmed	S,M,L,XL	Black	Glued & sewn	Thumb seam	22.80
SCUBAPRO 3105 E. Harcourt St. Compton, CA 90211	Gloves							
	58-475-100-	1/8", NP/N2	Edge trimmed	XS,S,M,L,XL	Black	Glued & sewn	Palm, thumb seam, tapered wrist, flared gauntlet cuff	20.00
	58-475-500							
	Mitts							
	58-010-200-	1/4", NP/N2		S,M,L,XL	Black	Glued & sewn	Thumb seam	19.00
SEASUITS 837 W. 18th St. Costa Mesa, CA 92627	58-010-500							
	Gloves							
	G-1	1/8", NP/N2	Edge trimmed	XS,S,M,L,XL	8 colors	Sewn	Palm seam	14.95
	G-2	3/16", NP/N2	Edge trimmed	XS,S,M,L,XL	8 colors	Sewn	Palm seam	15.95
	G-3	1/8", NP/N2	Edge trimmed	XS,S,M,L,XL	8 colors	Sewn	Textured neoprene palm, palm seam	14.95
	G-4	3/16", NP/N2	Edge trimmed	XS,S,M,L,XL	8 colors	Sewn	Textured neoprene palm, palm seam	15.95
	Mitts							
	M-1	1/8", NP/N1	Edge trimmed	XS,S,M,L,XL	Black	Sewn	Textured neoprene exterior	10.95
	M-2	3/16", NP/N1	Edge trimmed	XS,S,M,L,XL	Black	Sewn	Textured neoprene exterior	12.95
	M1-1	1/8", NP/N2	Edge trimmed	XS,S,M,L,XL	8 colors	Sewn		12.95
SPORT DIVERS, MFG. 1923 N.E. 150th St., Miami, FL 33161	M2-2	3/16", NP/N2	Edge trimmed	XS,S,M,L,XL	8 colors	Sewn		14.95
	Gloves							
	20-102	Cotton	Elastic knit	Men's M,L	Tan with white cuff		Vinyl coated	4.60
	20-103	Cotton	Elastic knit	Women's M,L	Tan with blue cuff		Vinyl coated	4.60
	20-105	Cotton	No cuff	Men's M,L	Beige		Vinyl coated	4.45
	22-515	Knit	No cuff	Men's M,L	Beige		Rubber covered	3.95
	22-516	Knit	No cuff	Women's M,L	Beige		Rubber covered	3.95
	1-114	Vinyl impregnated	Edge trimmed	Men's M,L,XL	Brown/black trim			4.95
	1-116	Vinyl impregnated	Edge trimmed	Women's S,M,L	Brown/red trim			4.95
	9-352	Stretch fabric	X-long gauntlet	S,M,L	Light green/dark green		Rubber coated	5.25
SUB-AQUATIC SYSTEMS 530 Sixth St. Hermosa Beach, CA 90254	4-404	Cotton	Elastic knit	Men's	Green/white		Rubber coated	4.50
	4-405	Cotton	Elastic knit	Women's	Green/white		Rubber coated	4.50
	4-412	Cotton	X-long gauntlet	M,L	Green		Rubber coated	5.50
	10-10	Cotton	Elastic knit	M,L	White/black		Black plastic dots	2.50
	10-11	Stretch knit	Elastic knit, Edge trimmed	S,L	White/black		Black plastic dots	2.35
	Gloves							
	9005	1/8", NP/N1	Tabbed	XS,S,M,L,XL	Black	Glued & sewn	Palm seam, thumb seam	22.00
	9006	1/8", NP/N2	Edge trimmed, tabbed	XS,S,M,L,XL	Black, blue, with orange	Glued & sewn	Palm seam, thumb seam	24.00
U.S. DIVERS 3323 W. Warner Ave., Santa Ana, CA 92702	9008	1/8", NP/N2	Edge trimmed, tabbed	XS,S,M,L,XL	Black	Glued & sewn	Palm seam, thumb seam	24.00
	Mitts							
	9007	1/4", NP/N2		XS,S,M,L,XL	Black, blue, with orange	Glued & sewn	Thumb seam, index finger seam, three finger seam	31.00
	9007-T	3/16", NP/N2		XS,S,M,L,XL	Black, blue, with orange	Glued & sewn	Thumb seam, index finger seam, three finger seam, cuff seam	31.00
WHITE STAG 363 W. Victoria St., Gardena, CA 90248	Gloves							
	54951	1/8", NP/N2		XS,S,M,L,XL	Black/blue	Sewn	Palm seam	27.95
	54952	3/16", NP/N2		S,M,L,XL	Black	Glued & sewn		22.70
	54956	1/8", NP/L2*	Edge trimmed	S,M,L	Black			
U.S. DIVERS 3323 W. Warner Ave., Santa Ana, CA 92702	54957	1/8", NP/N2		S,M,L	Black/orange	Glued & sewn	Palm, thumb seams	24.50
	54959	1/8", NP/N2	Edge trimmed	XS,S,M,L	Black	Sewn	Palm, thumb seams	25.50
	Mitt						Palm, thumb seams covered by seam finish	28.00
	54982	1/4", NP/N2		S,M,L	Black	Glued & sewn	Palm, thumb seams	24.50
							Palm, thumb seams	23.00

DIVE GLOVE *Roundup*

knit lining. This will help keep your hand from chafing, as it might if it were constantly irritated by a rough surface.

DURABILITY

In respect to the durability of your gloves, keep in mind that different gloves are designed for different tasks, and to be fair you should use the glove within its limits. You might need to pay a little more to gain durability, and you might have to give up some dexterity to gain the toughness needed for wreck diving, lobster chasing, or scrubbing the bottom of your boat.

In determining the durability of non-neoprene gloves, as with neoprene gloves, I suggest you look at the material, its thickness, its elasticity, the construction of the seams, the grade of thread used to sew the seams (if they are sewn), the elasticity and shape of the cuff, whether the cuff is edge trimmed or protected in any manner, and then consider how your particular underwater activities will affect the glove. As long as the seams of non-neoprene gloves look sturdily built, there is no reason to be concerned with whether or not they will leak — because all of the non-neoprene gloves will leak constantly. Most of the vinyl gloves, cotton gloves, tafetta models, and stretch styles have sewn seams, while the rubber gloves have seams that have been fused by heat treating. Remember though, a pair of gloves that sells for \$3 can be just as durable as a pair that sells for \$10, if used within its design limits, but as a rule you should expect to pay a little more for added durability.

As with neoprene gloves, it is important to rinse your gloves with fresh water after diving, especially after diving in salt water or water that supports a lot of bacteria. After washing, dry the gloves out of direct sunlight and store them in a cool, dry environment. This will also prevent unpleasant odors. Cotton gloves have a tendency to mildew rather quickly if left wet, so it is especially important to wash and dry them within a day or so of use. Leather gloves can become dried out with a lot of salt water use, and a little oil can help prevent drying and cracking.

CONCLUSION

Whether neoprene gloves or mitts, or any of the variety of non-neoprene gloves, dive gloves can make your dives more pleasant. With the diversity available there is a lot of room for choice; even after you consider important factors such as the specific needs of your favorite underwater activities, and water temperature. Your gloves will always serve you best when matched with the specific activities for which they have been designed; whether that is simply for thermal protection, or for providing protection and flexibility. ➤

Sport Divers Mfg.,
Coral Diver's Glove, 1-114, 1-116

Sport Divers Mfg.,
Scorpio Gauntlet Glove, 9-352

Sport Divers Mfg.,
Lobster Gloves, 4-404, 4-405

Sport Divers Mfg.,
U/W Welding Gloves, 4-412

Sport Divers Mfg.,
Plastic Dot, 10-10

Sport Divers Mfg.,
Plastic Dot Stretch Knit, 10-11

SDM travel SECTION

Far from any hint of civilization, in the lonely reaches of the South China Sea, lies one of the world's great underwater paradises.

The name of this incredible island is Apo, and it lies some ten hours by boat from the nearest city. Here and at nearby remote islands, groups of divers have experienced some of the sea's most incredible sights. Two of these extraordinary contacts between marine life and divers occurred on a trip I escorted in April of 1979. Our dive boat was the enormous 102 foot *Seaquest*, a huge ship with the seemingly endless deck space and stability that only a large vessel can offer. Access to and from the water is very easy, and in most cases diving is done right around our anchorage. *Seaquest* also has small chase boats for those occasions when the reef is a short distance away.

The first close encounter took place at a rocky islet some hours south of Apo. There were ten divers in our group; the prior group's escort had told me a pod of cuttlefish had allowed several of his group to photograph it at this reef.

Armed with his data, we gathered underwater in the same vicinity. To our delight (and it must be confessed, surprise), within minutes, first one, then another, and finally a third cuttlefish put in an appearance. Time and again they returned to the very same coral head, and we soon realized that two of the three

THE SPLENDOR OF THE PHILIPPINES

BY CARL ROESSLER



photograph by Carl Roessler

were depositing eggs among the coral fingers. Sometimes all of us gathered about the coral head, and still the cuttlefish returned. Flashing a range of continuously changing colors, they moved fluidly about us, sometimes swapping roles and following the divers around the reef.

A few fantastic dive days later, we were anchored with the *Seaquest* at Apo, the focal point of our trip. The reefs were incredibly prolific, with intricate corals and clouds of reef fish. In addition to this parade of gaudy photo subjects, every single dive resulted in at least one encounter with a manta ray.

On the final afternoon, as the divers were enjoying their last few hours in these magnificent waters, we saw an amazing event. First one, then two, three, and fi-

nally four manta rays converged on our divers. Ignoring the busy Zodiac inflatable dropping additional divers right in the middle of the action, the four rays stayed. Swooping over and about, looping the loop against the sun and, in general, cavorting as if old hired hands, the four mantas added a final dazzling touch to a trip that had already been incredibly rich.

We had seen giant jellyfish (very unusual in tropic reefs), several different species of clownfish, nudibranchs in intense shades of hot pink and yellow, big drop-offs and dozens of other thrills.

See & Sea is actively promoting travel to the primitive out-islands of the Philippines for 1980. The programs feature a 12 day stay aboard *Seaquest*, with all meals, twin accommodations and unlimited diving. We mean unlimited — one of that last group I escorted enjoyed 11 tanks in a single day. For shallow water fish photography, it's hard to beat the lush reefs of these remote Philippine Islands.

The See & Sea programs also include a two-day stay in sophisticated Manila, with all meals and a hovercraft expedition to the fortress of Corregidor included in the program price. For further information on individual program participation, or on special group charters for eight or more divers, contact See & Sea Travel Service, Inc., 680 Beach St., Suite 340, San Francisco, CA 94109. 🐠

CLEARING BAHAMIAN CUSTOMS

Any vessel entering Bahamian waters must clear Bahamian Customs at the nearest port of entry. (Bimini, for Florida vessels.) This rule applies to private vessels as well as commercial vessels. Even if the vessel does not touch land in the Bahamas it must still clear customs. All commercial vessels must clear in and out, including bare boat charters and a vessel may not clear in and out at the same time. Private vessels not for hire may mail their transire — a cruising permit that must be carried with the boat while cruising in Bahamian waters — to Bahamian Customs after clearing customs in the U.S. It is against the law to keep the transire and use it on a subsequent trip.

The Bahamians have six new, very fast gunboats and they can and will seize vessels operating illegally. 🐟

HABITAT PHOTO COURSES

Captain Don Stewart of Habitat, Bonaire, is promoting September as a special underwater photography month. Events will include two one-week underwater photography courses, an underwater photo contest, treasure hunts, and

nighttime slide shows and movies. Prizes for the treasure hunt and photo contest will include a future dive vacation at Habitat.

The photography courses will be conducted September 13-20 and September 20-27. The course is designed to teach both novice and intermediate skills and will concentrate on the use of the Nikonos 35mm camera and accessories. A full diving program will be arranged as part of the course and same day slide processing will be available to aid students in analyzing their daily work. For information write Aquaventure International, P.O. Box 127, Gedney Station, White Plains, NY 10605. 🐟

BERMUDA WORKSHOP

Dr. William Jahoda, naturalist, Audubon lecturer and ecology-tour-leader, will be conducting a workshop at the Bermuda Biological Station. The 1980 program, Bermuda, Land & Sea, will run from September 22-29, and will be a non-credit environmentally-oriented workshop designed to study the natural history of Bermuda and the surrounding reefs. A variety of activities will be planned to enable participants to select those most suited to their individual interests and abilities; therefore programs will range from a broad natural history approach to a concentration on reef diving.

The cost for Bermuda, Land & Sea will be \$400 plus air fare to and from Bermuda; divers should allow an extra \$3 for each tank fill (tanks and weights are provided by BBS). Participants must be at least 18 years of age, and scuba divers must be fully certified. The workshop is limited to 30 people. Please address all inquiries to Dr. William Jahoda, Rt. 207, Lebanon, CT 06249. 🐟

AUSTRALIAN EXPEDITION

Twin Fin Dive Tours and Dive In Australia will co-host the first Australian underwater photography expedition featuring Marty Snyderman, whose work has appeared in SKIN DIVER, Sport Diver and National Geographic. Marty, an underwater photography instructor for PADI College in San Diego, will be teaching sessions at the Lizard Island Lodge facility and will cover: Equipment, how a camera works, film, light meters, available and flash lighting, wide-angle photography, composition and more for both beginning and advanced photographers.

The expedition includes air fare, transfers, most meals, accommodations, unlimited diving aboard the *MV/Auriga Bay*, tanks, backpack and weights. Departs November 30 to December 13, 1980. For information write Twin Fin Dive Tours, 475 17th Street, Suite 744, Denver, CO 80202. 🐟

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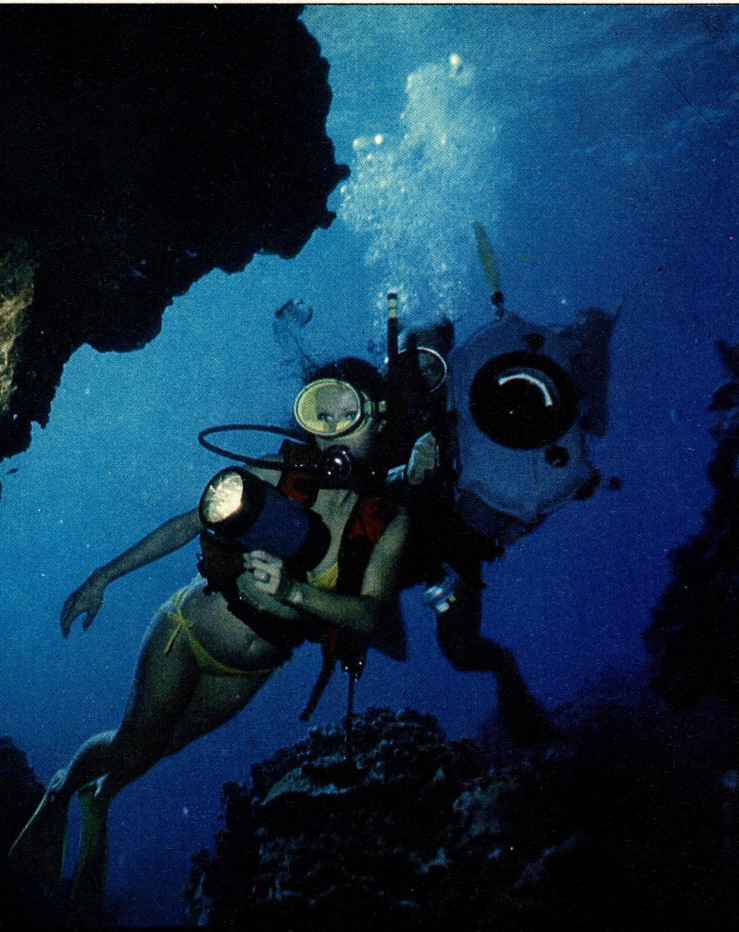
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Cayman Islands
Department of Tourism

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U/W TOURS EXPANDS

Bert Kilbride has expanded his facilities in the British Virgin Islands to accommodate an increasing number of diving tourists. In addition to his base of operation at Saba Rock, Virgin Gorda, Bert has now opened another operation at the fabulous Peter Island Yacht Club.

Managed by son Mike Kilbride, plans at Peter Island include a new retail operation, dive tours, rentals, instructions and air fills. Three dive boats are also available: a new 31 foot Bertram, and 30 and 42 foot dive boats.

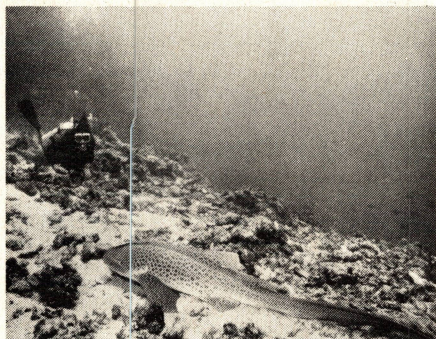
The crew at Kilbride's Underwater Tours now numbers eight, and they teach PADI certification courses, resort courses and advanced courses. For information, write Bert Kilbride's Underwater Tours, Saba Rock, Box 40, Virgin Gorda, BVI. ☛

POSEIDON TO RED SEA

Naturalist and marine biologist, Steve Smith, will lead an expedition to the Straits of Tiran and Ras Muhammad. Smith, who is the national diving control officer for the U.S. Outer Continental Shelf program, will supplement the dive adventures with lectures about the wide variety of marine life divers will experience. The tour leaves September 15 and arrangements can be made by calling Poseidon Ventures at (714) 644-5373. ☛

SEE & SEA TO AUSTRALIA/CORAL SEA

See & Sea Travel has arranged an expanded schedule of dive programs to the Coral Sea. For the 1980 programs, See & Sea is using the new *Reef Explorer*, a fast, completely equipped live-aboard



vessel designed for divers.

See & Sea's 1980 Fall schedule has three Coral Sea departures: September 23, October 7 and October 21. These two-week adventures will feature the Marion Reef, 150 miles beyond the outer limits of the Great Barrier Reef. Famous for exciting diving, these Coral Sea reefs are still almost untouched.

Dewey Bergman of See & Sea will escort the September 23 program, while Carl Roessler will host photography specials on the October 7-23 and October 21-November 6 adventures. For information contact See & Sea Travel, Inc. ☛

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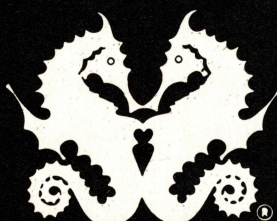
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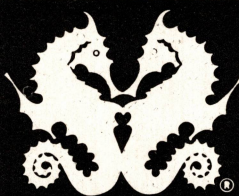
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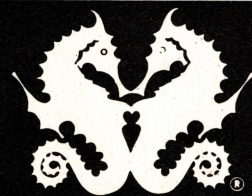
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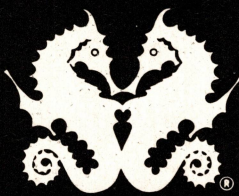
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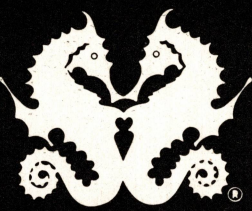
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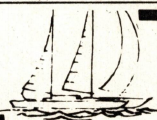


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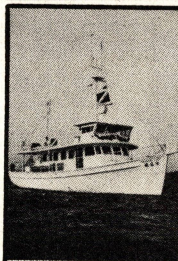
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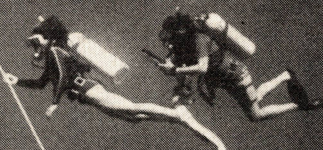
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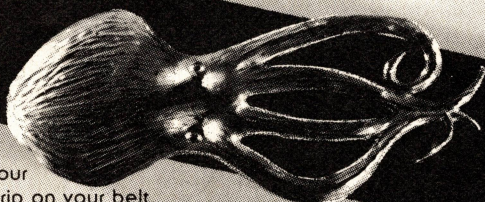
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CONTINENTAL
AIRLINES



BAHAMAS MEDICAL SEMINAR

The next course on the medicine of sport scuba diving will be held on the island of San Salvador, Bahamas, October 18-25, 1980. The course is designed for physicians who dive and/or see divers in their practice and must stay abreast of rapidly changing developments in emergency care of dive accidents, physical examinations, decisions on dive fitness and preventive medicine related to diving.

A complete dive program is also included for those who are already certified divers. For physicians and their



companions who wish to become certified scuba divers, a full certification course will be offered. Special U/W photography courses will also be available during the week from Dave Woodward, professional photographer. For a brochure and academic schedule, contact: Medical Seminars, Inc., P.O. Box 530441, Miami Shores, FL 33153.

DIVE ADVENTURE

In the early 1970's, Bob Goddess joined the Marker Buoy Dive Club in Seattle, Washington. His reputation as an organizer soon led to positions as dive coordinator, vice president, president and committeeperson of various dive oriented organizations.

What began ten years ago as a volunteer effort for his dive club, has developed into a full-time job organizing unique dive adventures to such places as Bonaire, Puerto Rico, Virgin Islands, Curacao, Grand Cayman, Cozumel, Belize, Honduras, Guatemala, Hawaii, Fiji, Samoa, Micronesia, Australia, the Coral Sea, Indian Ocean, and the Red Sea. This year, Bob has announced that the diving public is now invited to join these unique trips. Information on upcoming trips can be obtained by contacting: Bob Goddess, 1425 - 4th Avenue, Seattle, WA 98101.

ORMK/08

"Even after 14 years, diving in The Bahamas never ceases to amaze me.

Here, in clear, turquoise waters, the novice and expert will find new reasons why they took up the sport.

It's a field of vision that averages 125 feet. An unending variety of fish. The 2nd largest barrier reef in the world. Plus 400 years' worth of shipwrecks. Mysterious

blue holes. Caves. The excitement of a night dive. And everywhere, coral so dazzling it will take your breath away.

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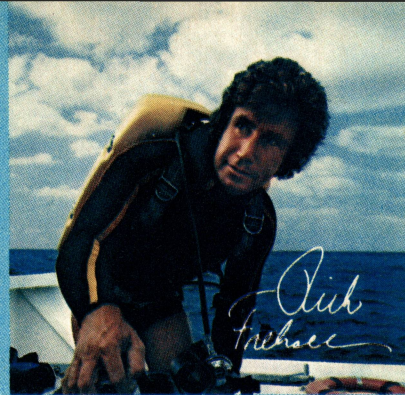
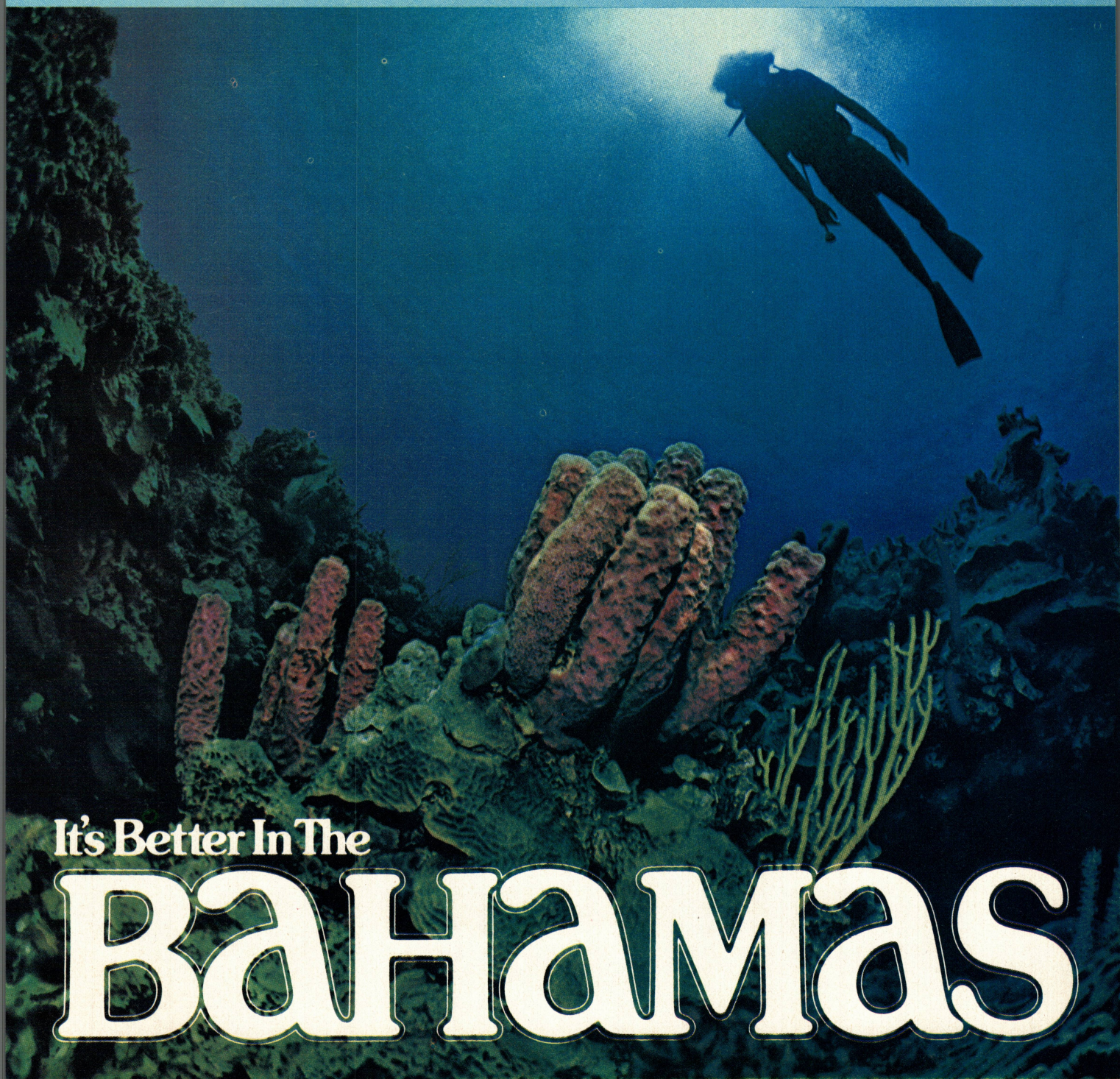


Photo Journalist

After more than
1,000 dives and 10,000 pictures, I feel as if
I've just begun to see The Bahamas.



It's Better In The

BAHAMAS

Plunge over a spectacular wall, rocket through the fabulous Current Cut, explore sunken ships and help name sections of virgin reef. Where? At Valentine's Diving Centers. Only a short hour and 15 minutes east of Ft. Lauderdale, by air, lie the islands of North Eleuthera, home of Valentine's two dive centers. The more established Valentine's Yacht Club, nestled upon historic Harbour Island, has been serving divers for the past five years. The second center, quartered on Spanish Wells, now allows guests from Valentine's Beach Resort to visit the reefs surrounding the island.

Harbour Island has long been a center of Bahamian activity with Dunmore Town once acting as the capitol. The architecture, reminiscent of times past, blends incredibly well with the town's relaxed atmosphere. Traveling south from Dunmore one finds Valentine's Yacht Club, garnished with tropical shrubbery. Owned and managed by Jack Valentine, the 27 room club caters to all. Sailing and fishing are always available while swimming may be done from the beach or in the luxurious pool. Play several sets of tennis on the hard surface court, with palm trees and hibiscus serving as wind screens. Or, catch a few z's in a mesh hammock. And, of course, there is scuba diving.

Jim Valentine operates the Yacht Club's dive center with the skillful aid of native divemaster, Ramon Thompson. A 35 foot Stuart Angular and a 45 foot Wilson easily transport divers to the surrounding reefs. Rental equipment is abundant and air is pumped from a 16 cfm Worthington compressor into 60 new aluminum 80's. Diving is primarily conducted off the southern tip of Harbour Island at areas such as the Plateau, the Glass Window, and Miller's Reef.

The Plateau consists of deep coral crevices beginning at 50 feet and extending down to 100 feet. Visibility is usually excellent and sponge life predominates. The Glass Window, while not a reef, was formed by huge boulders which fell into the sea. Divers delight in traversing these large formations and when the surf is up the foamy breakers can be admired from below. Miller's Reef, lying in deeper water, staircases from 60 feet to over 120 feet. Visibility is generally good and fish life is more extensive than in other areas. Wreck diving is done along the Devil's Backbone, a continuous 24 mile section of hard coral stretching from Man Island to Egg Island. One of the more famous dive spots, the Train Wreck, is midway between the two dive centers. The encrusted remains provide an excellent backdrop for U/W photographers and the wreck is accessible from either center.

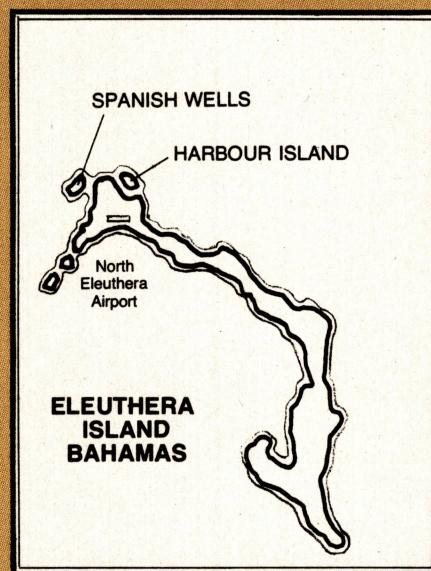
All diving west of the Train Wreck dis-

patches from the center located on Spanish Wells. Divemaster Robert Stephens and native guide David Hudson transport divers from the Beach Resort and Harbour Club to their dive destinations aboard a most impressive fleet of vessels. From Spanish Wells one may wall dive offshore Egg Island, drift dive through the Current Cut, or explore wrecks such as the *Cienfuegos*. David and Robert will gladly accept the assistance of the adventurous in mapping virgin areas of the Devil's Backbone north and east of Spanish Wells. During our stay my dive partner, Connie Brown, and I had the pleasure of exploring the reef structure encompassing Ben's Bay. On the north face of the Backbone large

their volleyball skills at the weekly Ben's Bay picnic.

A brisk walk around Spanish Wells is a must. The Spaniards named it centuries ago when they found the island's well water the sweetest in the Bahamas. Spanish Wells is now inhabited by descendants of the British Royalists who fled the U.S. during the Revolutionary War. Picturesque homes are sprinkled throughout the neatly maintained island which possesses a plentiful supply of fresh water and generates its own electricity. Sawyer's Marina lies on the south side of Spanish Wells and is the launching site for all boating activities. Six Boston Whalers, two Sunfish and a Catamaran are available for rent.

VALENTINE'S^{OF} NORTH ELEUTHERA



The map illustrates the location of the two Valentines: Valentine's Yacht Club, Harbour Island, and Valentine's Beach Resort, Spanish Wells.

hard coral heads encrusted with seafans and gorgonians rest in depths beginning at 30 feet which gradually slope to over 100 feet. Inside of the Backbone huge coral outcroppings stretch from the talc-like sandy bottom at 25 feet to the surface. These massive structures provide excellent refuge for snorkelers as well as divers wishing to cool off from testing

Bahamas Resort Chain Offers A Two For One Diving Bonus

Text and Photography by Mark Davis

The Beach Resort, located on the northern bank of Spanish Wells, possesses a beautiful stretch of pink sandy beach excellent for soaking up some rays. The beach is only a stone's throw from the resort's 21 rooms and 8 cottages. Guests may indulge in deep sea fishing, tennis, or free resort scuba and snorkeling instruction. Ron Lipman and Dollie Nordman are the managers. Gourmet dining and evening entertainment provide a marvelous ending to the day.

Double your pleasure by dividing your stay between Harbour Island and Spanish Wells for the most diversified dive vacation you've ever experienced.

For more information, additional details, or reservations contact: Valentine's Diving Centers (502) 897-6481 in the U.S. or (809) 333-2142 in the Bahamas. Air fares may be arranged by contacting Pompano Airways of Ft. Lauderdale, (305) 776-0330 or Pro-Air in Miami (305) 685-2784. ✈



The Train Wreck lies in 15 feet of water in the middle of Devil's Backbone. The train was the main cargo of a wooden barge which sank during a storm in 1865. The wreck consists of three sets of locomotive wheels and axles.

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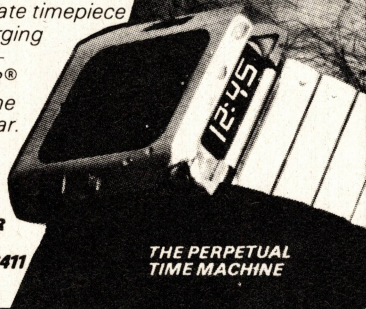


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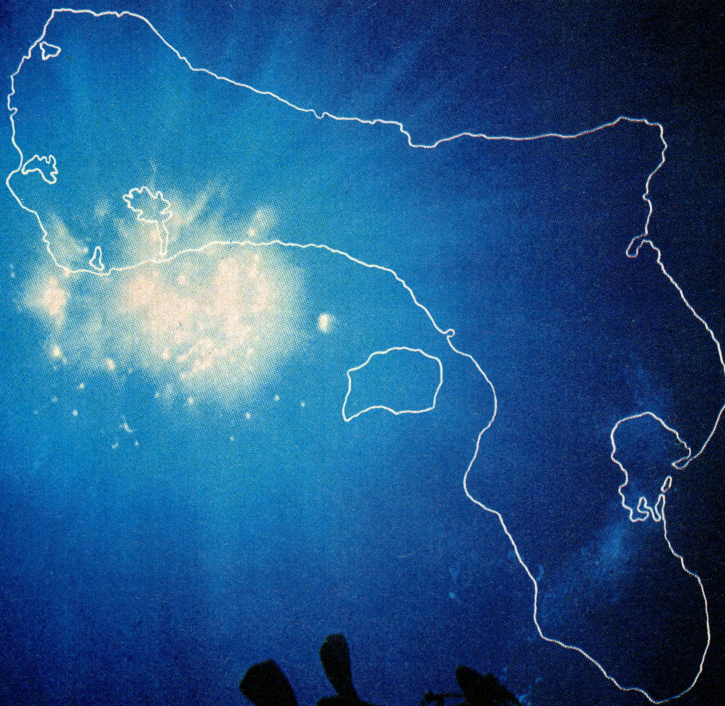


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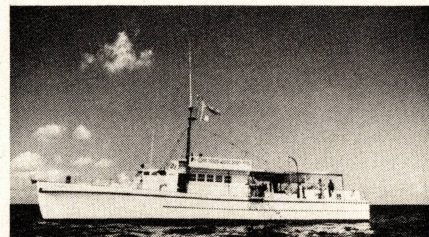
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PHOTO BY ALICE HUGHES

CAYMAN DIVER

See & Sea Travel has announced that the Cayman Diver has been sold. New owner John Novack and new captain, Jerry Jones, have pledged to continue the first-class programs for avid divers made famous by the Cayman Diver.

Paul Humann, long-time owner and captain, will become See & Sea's Carib-



bean general manager, overseeing the dive operations in Belize and Roatan as well as Cayman. For information on Cayman Diver cruises contact See & Sea Travel Service, Inc. 🐠

DEEP ADVENTURES II

Captain John Larsen has launched the East Coast's newest and best equipped dive boat, *Deep Adventures II*, out of Point Pleasant, New Jersey. For the first time, wreck diving enthusiasts in the Northeast will be afforded luxurious resort-style dive boat accommodations.

A charter normally carries from 20 to 25 people and is available seven days a



week. Though many dates are already booked, Capt. Larsen still has openings for this season. Interested groups should contact John Larsen in New Jersey at his office, (201) 727-2261, or at the boat, (201) 899-0551. 🐠

ST. THOMAS DIVING CLUB

The St. Thomas Diving Club recently opened 12 new air-conditioned rooms, the West Indies House restaurant, and a PADI training facility at the Villa Olga Center. St. Thomas Diving Club has dive packages with most of the major hotels on St. Thomas and offers the most complete dive schedule available, including open water check-out dives for PADI, NAUI, and YMCA. For information write: St. Thomas Diving Club, Box 4976, St. Thomas, USVI 00801. 🐠

DIVING PHYSICIANS GO COMMERCIAL

For three days, eleven physicians who are dive medicine consultants to Dive-Med International, were students at the Commercial Diving Center, Los Angeles harbor. Dive-Med International, whose corporate offices are in Baltimore, Maryland, provides medical and safety services to the recreational and commercial dive industries. It also provides a means for diving physicians not associated with university hyperbaric departments or the military service, to continue their dive medicine education. 🐠

RIGHT WHALE AND CALF

The Massachusetts Audubon Society will publish a limited edition of a color print, entitled Right Whale and Calf by renowned marine artist and biologist Richard Ellis. Available only from the Massachusetts Audubon Society, this work of art will have great meaning for conservation-minded divers. The cost of each print is \$100 (unframed); it will measure about 22 inches by 28 inches and will be printed by Triton Press of New York.

The edition is limited to only 1000 prints, each one numbered and signed by the artist; there will be no second impression.

Order from the Massachusetts Audubon Society, South Great Rd., Lincoln, MA 01773. 🐠

AQUATIC EMERGENCY CARE

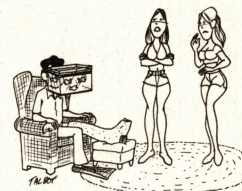
Published by the Royal Life Saving Society Canada, *Aquatic Emergency Care* is the first Canadian publication to address emergencies which occur in aquatic facilities. This 40 page, soft cover text discusses etiology, assessment, and emergency treatment for drowning, cardiac arrest, shock, unconsciousness, and spinal injury. Specialized chapters deal with the responsibilities of the aquatic professional (seasonal or full-time) as he/she confronts the changing role of the lifeguard, and stress and rescue performance. Dr. John Hayward contributes an update chapter on hypothermia (a follow-up to the 1976 RLSS Symposium, cold water immersion); Dr. Don Mertens details scuba-related emergencies; and Dr. John Butt explores the moral and legal ramifications of a patron's death. For information write to The Royal Life Saving Society Canada, 550 Church Street, Toronto, Ontario, Canada M4Y 2E1. 🐠

PADI'S 1980 EXTENSION COURSES

Lake Superior in August and Devil's

Lake, Baraboo, Wisconsin, in December are the training sites for three dive specialty courses offered on an extension basis by the PADI International College. Both instructors and divers may earn their specialty certifications in these courses. A four day deep/wreck diving combination will be conducted for dual certification in these two specialties, August 21-24. A six day U/W photography course will be taught by Jim Beckett, August 16-21. For all courses, plenty of boat diving on Lake Superior's famous wrecks is featured. Lodging, airport pickups, and all photo equipment will also be part of the package. For those divers not holding the advanced diver certification for wreck/deep diving, a two day preliminary advanced course will be conducted August 19-20.

Ice diving specialty certification, for both instructors and divers, will be conducted at Devil's Lake, Baraboo, December 26-28, and on February 13-15, 1981. Details may be obtained by writing PADI International College at: 1310 Rosecrans, Point Loma, CA 92106. 🐠



"He hasn't been diving for two months."

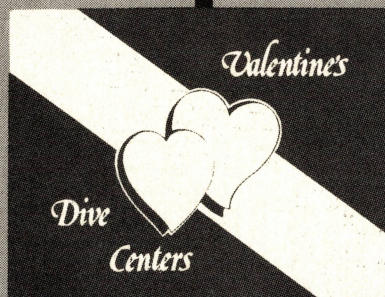
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PRODUCE YOUR OWN TELEVISION SPECIAL

TEXT AND PHOTOGRAPHY BY JIM AND CATHY CHURCH

With home VCR's (video cassette recorders) becoming more popular, it's only natural that Fotomat (and possibly other companies) will transfer your slides and movies onto video cassettes, either Beta or VHS.

They can transfer slides taken on standard 135 and 126 film, and you can choose a time interval of 5, 10 or 15 seconds between slide changes. These are made with a short dissolve, so the pictures blend together without blank spaces between them. If you want the screen to go dark at the end of your show, end with a black slide (black paper in a slide mount). Fotomat will also transfer regular 8mm or Super-8 movie film, either silent or with magnetic sound, at either 18 or 24fps. They will remove any unexposed or clear film from your movie for a reasonable charge.

QUALITY

As a test, we had Fotomat transfer a series of duplicate 35mm slides and a Super-8 movie onto Fuji video cassettes. To ensure we would receive standard customer service, without any chance of special treatment, we didn't tell them about this article.

While, in our opinion, an original slide or movie projected onto a good screen with a good projector lens has better quality — the projected images are larger and sharper — the video cassette transfers were surprisingly good. For best viewing, we turned the contrast level of our color TV to the lowest level and readjusted the color settings.

VIDEO CASSETTE ADVANTAGES

Transferring your slides or movies to video cassettes offers some important advantages when compared to projecting on a screen:

1. The mechanics of showing your pictures with a VCR is significantly easier than setting up a projector, screen and speaker system for sound. And to project slides with a dissolve requires two projectors, a dissolve unit and usually a tape recorder. With the VCR, you insert the cassette and press the play button!

2. You can record your own narration and background

music directly onto the video cassette with your VCR. Thus, you can add sound to your shows easily with a minimum investment.

3. Viewing your show on a TV screen may actually be more comfortable for small audiences. Although the picture is smaller, people are accustomed to watching television. They can sit where they want without blocking a projector beam, and they won't be bothered by distracting projector noises.

4. And your original film, of course, is protected from the

With a video cassette recorder, your slides or movies, and Fotomat's aid you've got the basics for a unique TV special.



heat and wear of projection.

As for disadvantages, you can't vary the interval between slide changes or the dissolve rate. This would require a more expensive custom transfer service.

COST

At this writing, Fotomat will transfer 100 35mm slides for \$10 plus the video cassette, and 400 feet (about 27 minutes) of Super-8 movie film for \$9 plus cassette. A video cassette, depending on the brand and length of the tape, costs about \$15 to \$25. Prices can change, however, so consider these as approximates. When compared to the cost of duplicating slides or movies for projection, the cost of a video cassette transfer is reasonable. You can put a lot of slides or movie film on a two hour cassette.

ADDING SOUND

If you want to show your work at its best, add a sound track. To find out how important sound is, turn it off the next time you watch underwater scenes on television. You'll be amazed at the loss of impact!

Adding sound to a video cassette is called "audio dubbing." Most VCR's have an audio dubbing circuit and two audio inputs. One input is for a microphone; the other is a line input for dubbing directly from a tape recorder, record player or radio.

Because dubbing records new sound on the audio track, any previous sound is automatically erased. Thus, you can back up and start dubbing over again if you make a mistake. And because dubbing doesn't affect the video track, you can dub sound as often as you wish without affecting the recorded picture.

Here are some simple audio dubbing methods:

1. For voice only, plug a microphone into the "mic" input of the VCR. Set the VCR for playback and watch the picture on the TV screen. When you wish to add your voice, press the "audio dub" control on the VCR and speak into the microphone.

2. For both voice and music, the simplest method is to have an assistant operate a tape or record player as you speak. The microphone will pick up both your voice and the music from the speaker. (Note: The VCR audio dubbing circuit usually won't allow you to use the microphone and line inputs simultaneously. This is why we used the microphone to record both voice and music.)

3. To dub music directly from a tape recorder, or other such source, run a cord from the tape recorder output to the VCR line input. (The VCR owner's manual will explain how to do this.) Because you are dubbing without a microphone, household noises won't be recorded. You can monitor your recording by listening to the sound through the TV speaker as you dub.

(Continued on Page 66)

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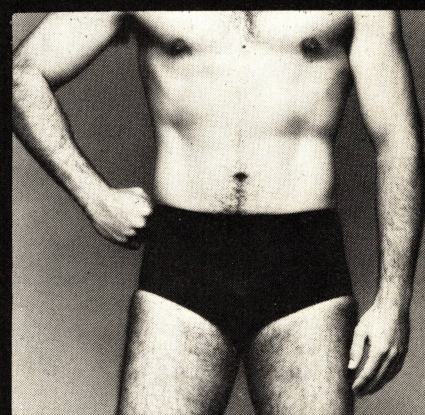
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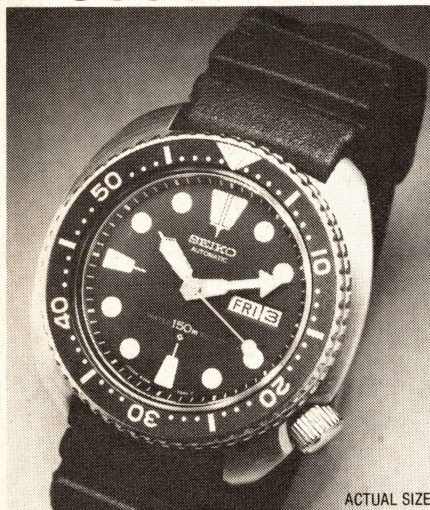
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Features a large, easy-to-read dial face with hour, minute, second hand and hour indicators coated with fluorescent Tritium for viewing at night or under water. And for accuracy while calculating elapsed time, the ratcheted bezel snaps into place until you decide to move it!

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No more replacing batteries, or remembering to wind your watch. Because this quality diver's watch is automatically self-winding—just set it and forget it! And because it's self-winding with a screw-in crown it doesn't run the risk of losing its water resistancy the way that Quartz watches do.

Calendar with day and date, and 1 yr. limited warranty.

This watch is sold elsewhere for up to \$200, but we're offering all this to you for just \$145.00

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Flower Gardens

(Continued from Page 28)

Every scientist who has commented on the toxicity of drilling muds states that no adequate studies exist upon which to base any conclusions. But the few short-term studies that have been made are frightening. The EPA laboratory at Gulf Breeze, Florida reports that muds diluted at 1 to 1000 were fatal to corals and that acute behavioral effects were caused by solutions diluted 1 to 10,000. Concentrations diluted enough to cause no effects could not be determined. No studies have been made on the dilution of muds in the ocean, or on the effects of shunting. Studies by Texas A & M showed substantial coral mortalities from drill muds and that barium sulfate, one of its chief constituents, is accumulated in shrimp — and reduced populations of micro-benthic organisms by 38 percent, with the number of species reduced by 25 percent. These studies also showed that visible mud plumes travel at least two miles and the distance invisible plumes can travel is unknown.

The National Academy of Sciences and the Government Accounting Office both state that BLM studies are not only

"The banks contain two separate reefs, the East, and West Flower Gardens, and each is a truly unique ecosystem with no similar formations known to exist anywhere else in the world."

poorly designed, but that the agency consistently ignores them in leasing decisions. The GAO questions whether the BLM knows how to design a study that is useful in management. These agencies state there is no evidence that a real nepheloid layer exists at the Flower Gardens that can be relied on to hold shunted muds near the bottom as claimed by oil companies and the BLM.

Thus, the regulations recommended by the EPA to protect the Flower Gardens are not even based upon a credible educated guess as to the impact of these operations. Section 403 of the Clean Water Act requires the EPA to have adequate in-

formation to make a reasonable judgment before issuing a permit. If the EPA complies with the law it enforces, it must deny the drilling permits. But, anyone who bets on this happening is suffering from a severe case of narcosis.

The oil companies have violently opposed even these mild EPA restrictions and demand the right to operate without any regulations of any kind. If they get their way, we can kiss the marine fisheries of the entire Gulf of Mexico goodbye.

The Flower Gardens are only one of hundreds of shallow banks in the gulf, all

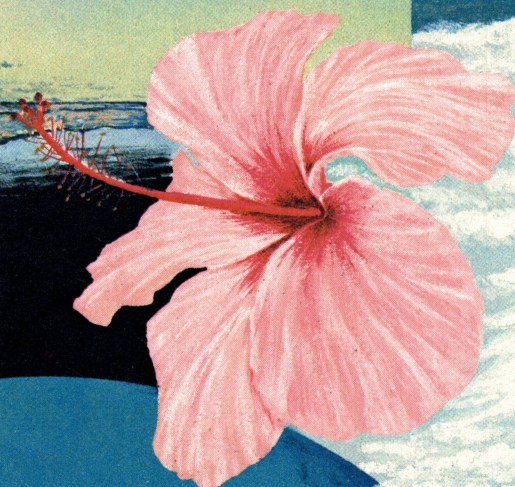
"The published policy of the EPA is to prevent or strictly regulate the dumping of any material in the ocean which would adversely affect human health . . . or the marine environment . . ."

of which are prolific fish-producing areas. If unrestricted drilling operations are permitted in a unique and sensitive area such as the Flower Gardens, the repercussions will permit oil companies to raze every shallow fish-producing area in the gulf. This includes the Florida Middle Grounds, and Florida's famous coral reefs, if oil and gas are suspected to be lying beneath them.

The United States needs the offshore oil. But we also need the food-fish production of natural marine areas such as the Flower Gardens, the Georges Banks of the Northeast Coast, and similar areas. We can have both, if the greed and aggressiveness of the oil companies can be curtailed.

Ironically, oil company executives are not immune from the danger of eating contaminated seafood. The risk to these executives is rapidly increasing. At the rate we are losing productive marine areas, seafood will soon be so expensive that only they can afford it.

The minor effect of a moratorium on future drilling in the Flower Gardens can be seen from a U.S. Coast and Geodetic Survey estimate that the unleased tracts contain only one million barrels of oil and 261 billion cubic feet of natural gas; an amount that the Natural Resources Defense Council, Inc. states is *three minutes of our annual consumption of oil and 24 minutes of our annual consumption of natural gas.*



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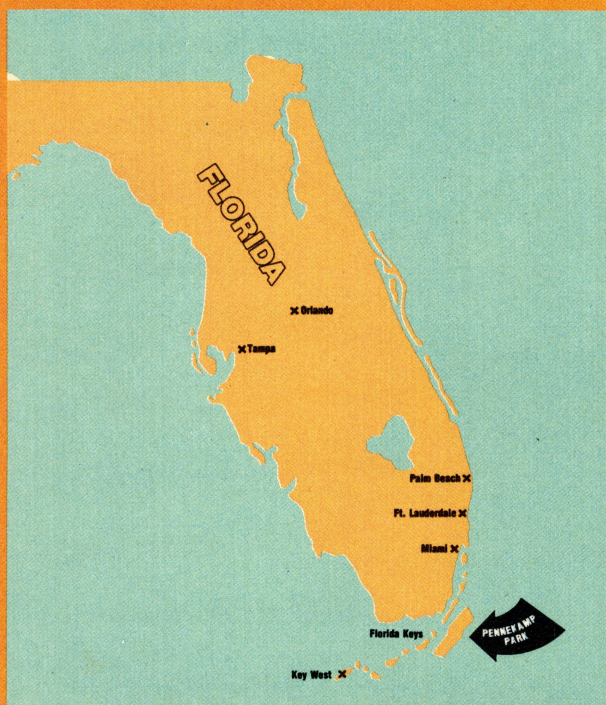
Pennekamp Park

Domestic Diving With a Caribbean Flavor

Text and Photography by Stephen Frink

One advantage to a career in underwater photography is the travel. There is always the lure of crystal waters and lush coral gardens in exotic dive locations you've yet to visit. But at the end of any trip it's good to be home, particularly when your home is Key Largo and the waters of Pennekamp Park.

More than 200,000 divers visit Pennekamp annually, and the reasons for this heavy traffic are diverse. First, the Park is very accessible. Just 50 miles from Miami at the north end of the Florida Keys, this is one tropical dive destination which can be reached by car, bus, private plane, or boat. Consequently, it is generally possible to travel with a heavier complement of dive gear. Unlike a foreign port, customs clearance is not a problem. There are no language barriers or foreign currencies to contend with. Once you arrive, lodging is easily obtainable in campgrounds, motels, and efficiency apartments. In a time of economic uncertainty, Pennekamp is both affordable and convenient. In addition, it offers some spectacular diving.



Janette Weeks encounters a school of grunts while diving Pennekamp Park. The area has flourishing populations of grunt, snapper, and colorful tropicals.



A frequently quoted statistic claims more dive shops per mile in Key Largo than any other area of the world. Competition makes them sharp, and each consistently upgrades the quality of service provided. Most often this takes the shape of boat improvements, because Pennekamp is definitely a boat dive. Topside support facilities are comprehensive as well. Retail sales, camera rental and film processing, scuba and photography instruction, and dive gear rental are all readily available; but without boats there would be no diving in Pennekamp.

The reef structure in this area is four to seven miles from shore. Beach diving is certainly permitted, but there is nothing to see other than mangroves, sand, and dirty water. The clearer waters of the Gulf Stream and the most dramatic coral structures, the reasons people come to Pennekamp, are approximately 45 minutes from shore by boat. Most operations feature two tank dives in two separate reef locations. There are no compressors aboard the boats, so it is each diver's responsibility to bring two tanks for the dive. The shops maintain extensive inventories of rental cylinders, and personally I'd much rather pay a few bucks extra to rent a tank than listen to a compressor run all day.

Over the years these boats have evolved into extremely efficient diver transport machines. Tank racks, dive platforms, large gear storage areas, freshwater rinses, an ice box, and frequently stereo are common on most boats. The captains are usually divers themselves, have explored these reefs, and have a feel for what the diver would like to see. Many a time I have been saved from a tight deadline by a cooperative captain with the knowledge of where to anchor to provide the right combination of fish, coral, and visibility necessary for a certain photograph.

There is no mistaking that this is a business for these people. The coral reef is a finite resource, and the livelihood of everyone in the local dive industry depends on its preservation. Therefore, anchors are placed with caution, and boaters in violation of the rules of the marine sanctuary are referred to the Marine Patrol immediately. Spearfishing is forbidden within the park boundaries, as is shell collecting. Shop personnel caution divers to leave their knives sheathed and not chop up the urchins to feed the fish. Careless buoyancy control can cause a clumsy diver to knock over a fragile stand of elkhorn coral. Considering the sheer number of divers we are dealing with here, unless each diver demonstrates a sense of responsibility the effect will be obvious.

Diver safety is another part of the business. Insurance regulations require that all divers be certified, and this is rigidly enforced. Zodiac chase boats are in use by a number of carriers to minimize the

risk of divers caught in current. The submersible pressure gauge and buoyancy compensator are standard equipment for divers aboard these boats. There are a few very fundamental safety precautions that require compliance, but, having a good time is the mutual goal of both customer and operator.

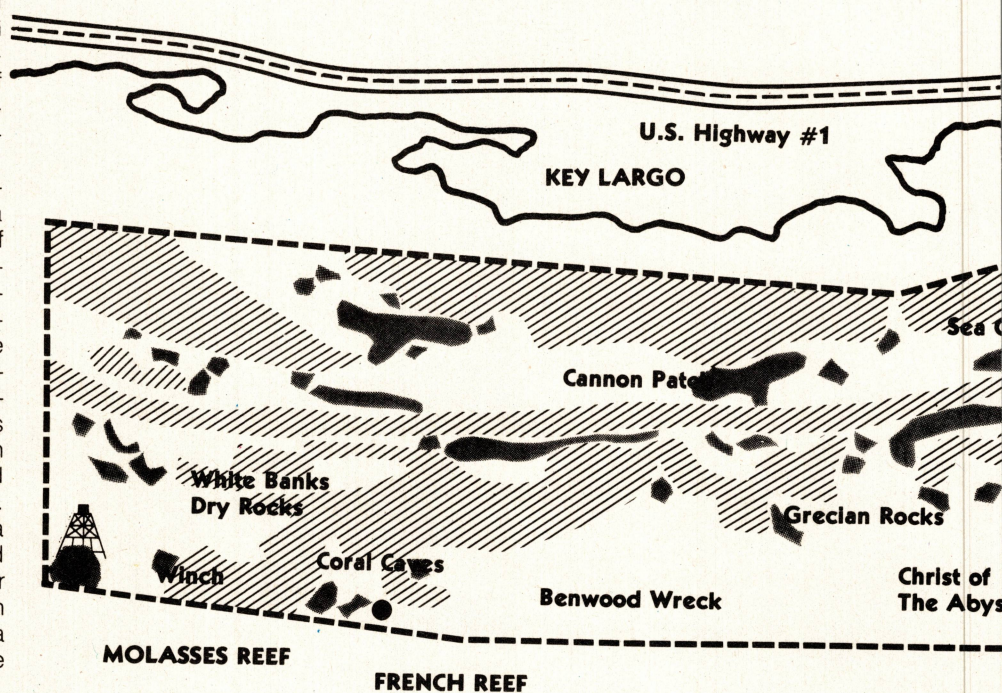
There is much about Pennekamp that is very special. I consider it my backyard photo studio: There is much that can be done here in a short period of time. The one outstanding attribute of these waters is the abundance of fish. Because the area has been a marine preserve for 20 years, populations have flourished. Huge schools of grunt and snapper, along with infinite variety of colorful tropicals, swim past the viewfinder waiting to be captured on film. It really is much easier here than in many areas of the Caribbean where the fish have been trapped and speared. Not only are there more fish to choose from, but they are easier to approach.

Visibility can be over 100 feet in the summer, but the norm is more like 40-50 feet year-round. Because the most effective fish photography is done three feet or less from the subject, this is certainly more than adequate. Molasses Reef is my favorite for fish photography. Because of its proximity to the Gulf Stream, visibility on Molasses is often the best in the park. The high profile corals make ex-

citing backgrounds for wide shots of schooling fish, and the heavy sponge encrustation provides accent color for shots of individual species. I probably dive this reef 75-100 times a year, and always find something new to experience and photograph. In fact, when time is tight and I have to get a photograph quickly, I'll go to Molasses to ensure that at least the environment is cooperative. Here I can count on the wreckage at the *Winch* to provide compositional elements, or the green moray, Mo, to perform. For overall consistency in a dive location, Molasses Reef is hard to beat.

Approximately one mile northeast of Molasses is another very popular area, French Reef. French is not as amply populated as Molasses but the numbers are quite respectable. However, it is the coral formations and swim-through caves that make French unique. Generally, I like French for working with models; unusual corals abound and the compositions seem to blend naturally here. In addition, the area is sprinkled with cleaning stations, making grouper and blue tang easy to approach. But it's the mental image of clouds of copper sweepers swirling about the entrance to a cave that best describes this reef.

Another two miles to the north will take you to the vicinity of the *MV Benwood*. Lying in 25-45 feet of water, the *Benwood* was a freighter torpedoed by a German



submarine near the end of World War II. Today it lies broken and scattered across 300 feet of sandy bottom and provides refuge for parrotfish, grouper, and large schools of porkfish. The sides of the ship are heavily encrusted with Christmas tree worms and other macro subjects. Copper sweepers and glass minnows swarm through the holds providing interesting backdrops for diver portraits. On the east end of the wreck the anchor is visible, partly buried in the sand. The area surrounding the *Benwood* is comparatively bland, although the deeper waters beyond the wreck have some interesting coral structures.

The Elbow forms the easternmost extension of the park and is well marked by a 36 foot lighted tower. The existence of several wrecks with ballast stones, timbers, and pins attest to the necessity of the tower's existence. The reef is generally shallow and typified by large stands of elkhorn coral. On a bright sunny day in these waters I am always sure to shoot a film with a relatively slow ASA. I've found that with the faster films and a focal-plane shutter binding me to 1/60 second shutter speed, even f22 can admit too much light in shallow water against a sandy bottom. The symbol of Pennekamp Park, the statue of Christ of the Abyss, is located in this area. Popular with divers and snorkelers alike, this reef seems to attract some of the largest bar-

racuda in Pennekamp. There is also a gorgeous stand of staghorn coral in shallow depths. In this area, as in many portions of the park, compressed air is certainly no prerequisite to deriving pleasure from the reef.

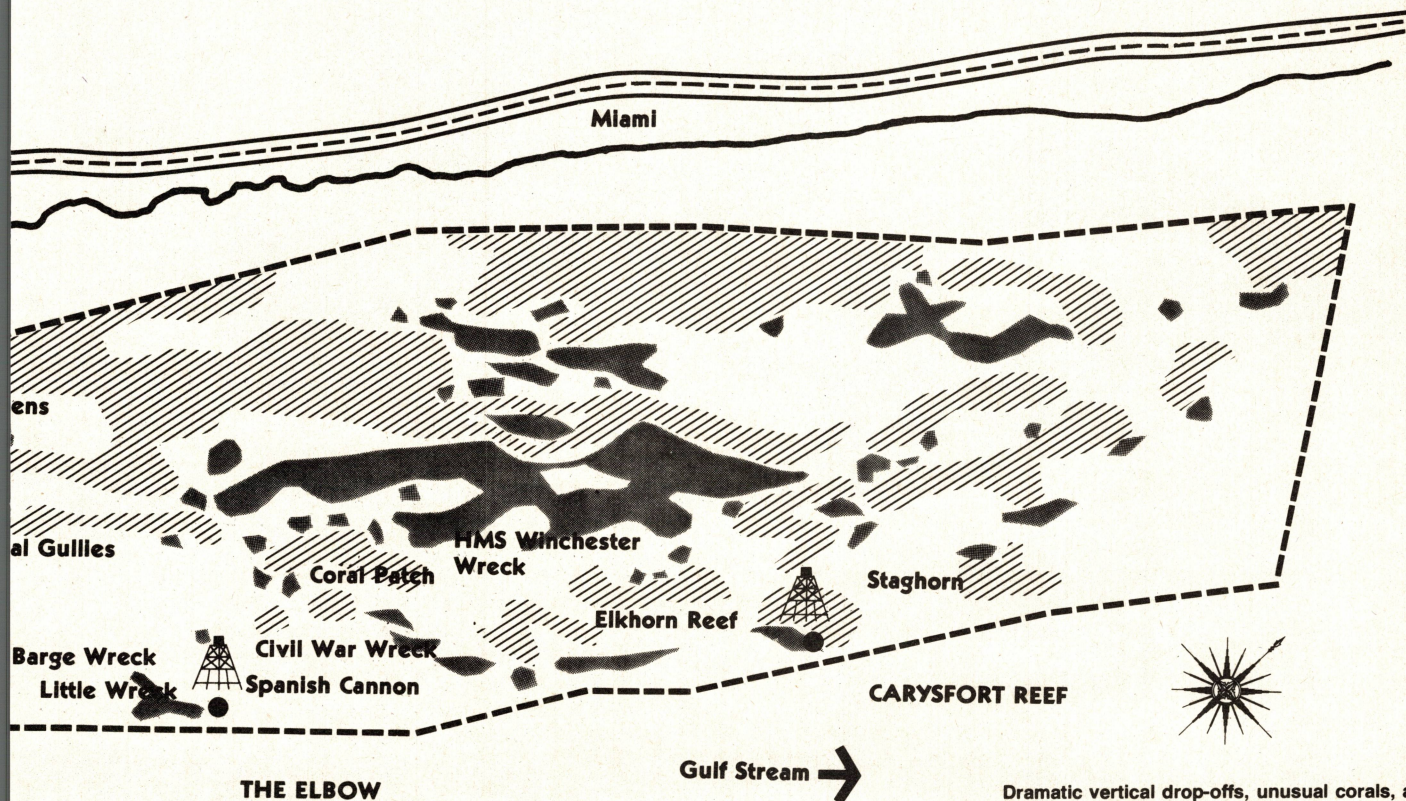
Another particularly fine snorkel area is Grecian Rocks. Here fish, coral, and a beautiful sandy bottom are apparent; all at an average depth of six feet. There is even a cannon on Grecian, although not as a direct result of a shipwreck there. The cannon came from a wreck off Carysfort Reef but was moved to Grecian to be more accessible to patrol, thereby reducing the risk of theft. Cannon Patch is another extremely shallow area pretty much reserved for snorkel traffic by charter boat operators. Depths here are often less than five feet, providing ample ambient light to view the two British cannons from which the reef derives its name. White Bank Dry Rocks ranges in depth from 5 to 15 feet and is visited by thousands of snorkelers annually.

At the northern end of the park stands the 125 foot Carysfort Lighthouse. Built in 1852, this structure marks an enormous stand of elkhorn and staghorn coral which comprise Carysfort Reef. Ancient wrecks of the *H.M.S. Winchester* and the *H.M.S. Carysfort*, cannon balls, and at least two galleon anchors attest to the fickle navigability of this area. As is common throughout the park, there is a profu-

sion of fish life, and in the more intermediate depths interesting high profile coral heads are numerous. Carysfort is a long trip for most of the dive operators in the park, and consequently is not dived much. In fact, I've only been there a few times. There are 73,000 acres of marine preserve here, and considerable time is required to see it all. Perhaps this is the reason Pennekamp plays host to so many return visitors.

One thing Pennekamp does not have is dramatic vertical drop-offs. Most of the diving is shallow. There are some nice dives at 60-80 feet, but the bulk of the most magnificent coral and abundant fish life is found around 35 feet. With two tank dives at these depths, decompression is not going to be a viable concern. Photographers are going to have adequate bottom time for a more relaxed shooting session, as well as increased available light. Instructors with open water checkouts find these waters ideal; Safe yet exciting for their students.

It would be nice to have a wall dropping off into infinity, encrusted with black coral and gorgonians. And it would be nice to have 200 foot visibility every day of the year. However, these are not realistic expectations of this destination. Come to Pennekamp expecting beautiful coral, more fish than you've ever seen, accessibility, and professional dive operations, and you'll not leave disappointed. 



Dramatic vertical drop-offs, unusual corals, and clouds of fish combine to make Pennekamp Park a frequent destination for underwater photographers.

The Farallon/Oceanic Slave/Strobe

Farallon/Oceanic, the world's largest manufacturer of submersible strobes, has just introduced a new slave strobe called the 2001-S. Similar in design and appearance to Farallon/Oceanic's 2001, 2002 and 2003, this new model contains a built-in slave triggering system that allows a strobe to be fired by the light output of another strobe — ideal for multi-flash lighting. It is indeed a welcome addition to Farallon/Oceanic's growing family of submersible strobe products.

The 2001-S possesses the same basic components and performs as well as the world famous 2001, the first underwater rechargeable strobe manufactured by Farallon/Oceanic. Introduced in 1975, tens of thousands of these flash units have been produced.

The outside casing of the 2001-S is constructed of extremely durable ABS Cycloc plastic. The power pack inside consists of a set of high quality GE Goldtop ni-cad rechargeable batteries, and extremely reliable electronic flash circuitry.

Just like its older brother, the 2001-S will produce more than 360 flashes from a fully charged battery. It recycles in approximately six to eight seconds and the battery recharges completely in four hours. The flash head features a wide-angle reflector and frosted dome port



Text and Photography by Geri Murphy

that produces a full 95 degree angle-of-coverage with evenly diffused light. The color output of this unit provides warm, lifelike flesh tones when used with Kodak Kodachrome and Ektachrome films.

The 2001-S is also a very powerful flash unit; it has an underwater guide number of 30 for ASA 64 films in clear tropical waters. For example, you would use an exposure setting of f5.6 at a distance of five feet from flash to subject — the identical setting used with the 2001.

The major distinguishing feature of the

2001-S is a light sensing trigger device known as a Light Activated Silicone Controller Rectifier (LASCR). This tiny device is positioned right in the flash reflector, directly behind the strobe's frosted front dome. It is connected to a special electronic circuit panel which has been integrated into the basic electronics of this unit. The LASCR allows the strobe to be fired independently of any flash cord connection to the underwater camera. It can be simultaneously fired by another strobe or flashbulb of any type.

A three-way switch on the 2001-S allows use of the strobe in a 'slave trigger mode or in a normal camera synchronization mode. A standard EO connector and flexible coil cord provide easy hook-up to either a Nikonos or underwater camera housing.

SKIN DIVER conducted a series of underwater tests with the 2001-S to determine the strobe's sensitivity and range for slave triggering. A standard 2001 strobe was used as the primary flash source for the test. For light meter comparisons, a simulated exposure value

The Farallon/Oceanic 2001-S slave/strobe has a built-in slave triggering system that allows it to be fired by the light output of another strobe — ideal for multi-flash lighting.



2001-S

of 1/60 second shutter speed and ASA 64 film was established. This is a common setup for medium distance flash photography in the tropical waters of the Caribbean or Pacific.

The best performance was obtained in a dimly lit situation with an ambient light level of f3.5. The 2001-S could be triggered repeatedly from 35 feet away. Underwater visibility was estimated to be 80 feet.

The 2001-S performance under moderate ambient light conditions was almost as good. With a surrounding light level of f8, the unit could be slave triggered from a distance of 30 feet.

A final test was made in extremely shallow water with bright sunlight and an ambient light meter reading of f22. Under these conditions, the 2001-S would not fire at any significant distance.

These underwater tests indicated the 2001-S slave triggering circuitry is extremely sensitive in the low light or medium light levels from f3.5 to f8. Extremely bright ambient light conditions of f16 and f22 tend to desensitize the slave triggering device. In other words, the 2001-S works especially well at

depths of 20 feet or deeper on bright, sunny days, or at most any depth on cloudy days. It would also work especially well in semi-clear waters of the California Coast, the Pacific Northwest or the East Coast.

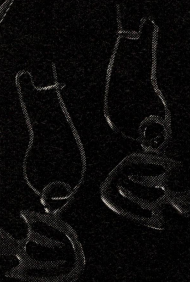
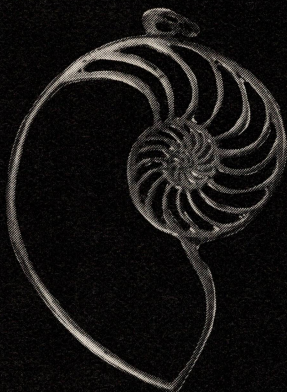
The 2001-S can be slave triggered from any position within the full 95 degree angle-of-coverage. It can also be triggered by bounce light from the photo subject, or a sandy bottom, as long as the 2001-S is fairly close to the subject.

In conclusion, SKIN DIVER found the 2001-S to be an extremely versatile flash device. It combines the power and reliability of the time tested 2001 with a remarkably sensitive slave triggering circuitry. It is the perfect mate for the

photographer interested in multi-flash lighting who is seeking a second strobe. The retail cost of this unit is \$573. For more information write to: Farallon/Oceanic, 14275 Catalina St., San Leandro, CA 94577. 

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Check the local library for commercial records. Generally, instrumental arrangements are best because strong vocals compete with the visual images. If you can cut and edit recording tape, however, you might edit some vocal music in effectively.

Special background music and sound effects records are commercially available. These can provide a variety of openings, themes, special effects and endings. You can use these records most effectively if you copy the sections you wish to use on a tape recorder, and then edit the tape before dubbing onto the VCR.

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VCR DEFINED

A VCR (video cassette recorder) is just a fancy tape recorder. It can record, or play back, two tracks on videotape. The picture is recorded on the video track, and the sound on the audio track. The videotape is prepackaged in plastic video cassettes. These are larger than regular tape recorder cassettes because the videotape is wider.

You play video cassettes with a VCR much the same way as you play tapes with a tape recorder. The big difference is that you attach the VCR to your television set — you see the picture on the screen and hear the sound through the TV speaker.

Most VCR's use either the Beta or VHS (Video Home System) format. Although the video tape is the same, the video cassettes and tape transport mechanisms of the VCR's are different. These two formats aren't interchangeable: Both the video cassette and VCR must have the same format — either Beta or VHS.

TWIN FINS TO ALACRAN

The Mexican Government has granted permission to Twin Fin Dive Tours of Denver to explore Alacran Reef, 80 miles north of Progreso, the northernmost port on the Yucatan Peninsula.

The crescent-shaped reef, ten miles long, contains the wrecks of a number of ships including: The *Sandwich*, sunk 30 years ago; *Candeleros*, from the 1800's; *Las Columnas*, an English ship sunk in 1836; and several unnamed Spanish galleons.

All wrecks are relatively untouched, and divers can explore the ships' treasures of bottles, coins, cannons, anchors, etc. The Mexican Government forbids taking artifacts from the reef so these treasures will remain for future divers.

Permission to operate package tours and conduct diving explorations there was obtained for Twin Fin Dive Tours by Jorge Benavides Pena, a Mexico City attorney interested in treasure diving, according to Frank D. Jones, president of Twin Fin.

Diving at Alacran Reef will be from the live-aboard, 80 foot dive vessel, *Antares*, the only commercial vessel of its kind permitted in the vicinity of the reef. The *Antares* has five cabins, and Jones said weekly tours from Denver for up to 14 certified divers began June 27.

From September through December, Twin Fin will offer dive-tour packages on the *Antares* to Chincorro Reef, southwest of Cozumel Island off the Yucatan's Caribbean coast.

From January through April, the *Antares* will take dive tour groups to Cozumel and nearby Isla Mujeres.

Further information can be obtained from Twin Fin Dive Tours at: 800-525-2112. 🐠

HAWAIIAN SNORKELING

Snorkeling opens a delightful window into the undersea world around the Big Island of Hawaii. Should you chance to spend some time around Hilo, particularly early in your snorkeling trip, a visit to Richardson Ocean Center will introduce you to the many tropical fish and crustaceans that live in these waters.

A nice side trip — off the beach at the beautiful Mauna Kea Hotel — is aboard the 58 foot catamaran, *Alii Nui*, for a day-long sail to good snorkeling areas. She has licensed skippers, diving and sailing instructors and comes supplied with snacks, beverages and both snorkeling and scuba equipment. *Alii Nui* snorkeling rates range from \$22.50 for a morning sail, to \$37.50 for a snorkeling and picnic sail. Their phone is Kamuela, Hawaii, (808) 882-7684.

Another nearby snorkeling site is an added plus to a unique Hawaiian experience.

Little Joe Kaipo of Kailua-Kona operates Hawaii Untouched, a venture back in time to a secluded beach for a day with old Hawaiian songs, Hawaiian entertainment, a barbecue, isolated relaxation and swimming, outrigger canoeing and snorkeling. Hawaii Untouched rates are \$27.50 for adults, \$14 for children under 12 years of age. Their phone is Kailua-Kona (808) 329-2944.

Further south along the coast is Kona Village, a self-sufficient resort on an isolated beach with South Seas-style thatched huts and superior food and service. Kona Village may be contacted at (808) 325-5555.

Sea Sleuth Snorkelers offers a Hawaiian Reef Life Class for \$8, gear rental is \$8, and gear instruction is free. Their phone is Kailua-Kona (808) 328-1788 or 322-3411, ext. 228. 🐠

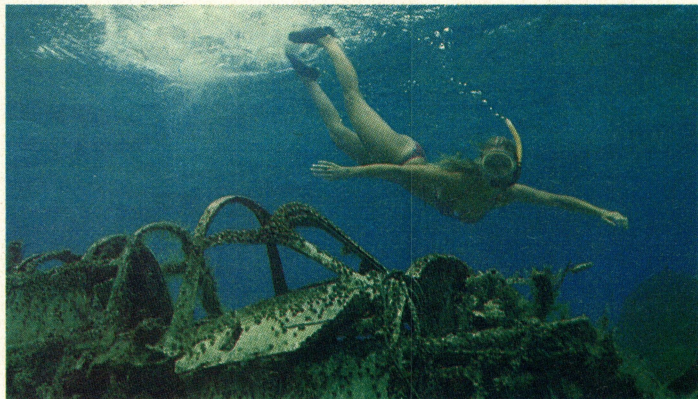
INSTRUCTORS GRADUATE

A class of diving instructors was certified last April 1980, at Marathon Key's, with Hall's Diving College. The instructors plan to open the first PDIC college in the province of Quebec, where the teaching will be in French/English. 🐠



tors plan to open the first PDIC college in the province of Quebec, where the teaching will be in French/English. 🐠

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The Dunraven

A Shipwreck Mystery That Spanned Two Continents

Text and Photography by Jack McKenney



Howard Rosentein was the first to dive on the *Dunraven*, almost 100 years after it sank in the Red Sea. Above, he displays artifacts recovered from the ship. Top, Sari Gains examines a wheel inside ship.

From inside the dark interior I glanced around at the corroding, jaw-toothed opening we had come through just moments before. These large, square entrances at the railing level were silhouetted against the iridescent, magical blue color of the sea. Next to me, buried up to his arms in the silty bottom, Howard Rosenstein was diligently digging into 103 years of history in search of artifacts. The interior of this section of the wreck was rapidly becoming engulfed in a dense cloud of silt. I nodded to Sari, who was concentrating the beam of her light on Howard's digging,

and we swam out of the cloud to explore the rest of the wreck.

As we swam into the engine room photographing machinery, ladders and a large wheel, I began thinking about the fascinating story Howard had told us about the *Dunraven*.

Our first contact with this wreck took place over a year ago when Sari, Bob Abrams and I were on location with the Red Sea Diving Center at Sharm El-Sheikh shooting *God's Other World – The Red Sea*. Just days before Howard had made his first dive on the *Dunraven* after an elderly Bédouin, by the name of Sulei-

men, had given him the general location. Suleimen had said the ship was one of T. E. Lawrence's, making its way from the Suez to Aqaba to finance the Arab revolt against the Turks during WWI.

Excited at the prospect of diving into the legendary past of this heroic figure, we eagerly anticipated our dive. Physically, the *Dunraven* is an impressive sight. She lies upside down in 90 feet of water in the Shard Ali Reef in the Gulf of Suez. The first recognizable portion of the wreck is the huge four plated propeller. Standing on the bottom and gazing skyward, the soft corals and a large growth of black coral soften the prop's hard outlines. To the right, the reef juts sharply upward to break at the surface, where at low tide its tabletop is exposed to the air.

A year had passed before Sari and I were again able to dive the *Dunraven*. During that time, Howard and I had corresponded about the ship and sitting in California, I could well imagine the excitement he must have felt as he delved into the research of this virgin wreck. In November, 1978 Howard brought up a plate bearing the ship's name. He had discovered it while diving with his friend, Samuel Lewis, the U.S. Ambassador to Israel, and assistant air attache, Marshall

Michel. Since then, because of the distance and the difficulty in locating the site, Howard has been almost the only one to visit it and bring back artifacts. But the research involved in unraveling the *Dunraven*'s history proved almost as exciting as diving on her.

Contact with Lloyds Register of Shipping in London brought news that was disheartening and confusing. Not only did it seem that the ship had not belonged to Lawrence, but there were two *Dunravens* registered with Lloyds. The first had been renamed the *Sara Radcliff*, and sank in the Atlantic in 1917. The other *Dunraven* had been renamed the *Marshall*, badly damaged in the first World War and sunk in the English Channel. It was possible, however, that the *Dunraven* was a British Q-class warship deployed on a secret mission during the first World War. At one point during the research the British Admiralty requested that all dive operations be ceased because of the possibility that the *Dunraven* was a British war grave.

Shortly after receiving all of these mixed reports, Howard discovered proof that the ship was not what he had originally assumed it to be. He brought up round bottom bottles inscribed, "Webb's Double Soda and Other Waters. By ap-

pointment to Her Majesty the Queen. Islington, London." By this time, the BBC was involved in making a film about the *Dunraven* and checking in London, they found that the Webb Company was founded in 1836 and went out of business in 1880. This proved the *Dunraven* sank almost 35 years prior to Lawrence's Middle Eastern campaigns.

On the numerous plates Howard brought to the surface, the initials G.F.B. appeared. George F. Bains had won first prize at a London fair in 1873 for porcelain design. Coupled with the Webb Mineral Water Company information, the evidence showed that the *Dunraven* sank sometime prior to 1880. The Suez Canal opened in 1869, so it was in that time span that the *Dunraven* was a merchantman plying the trade route between India and England. Its home port was registered as Newcastle upon Tyne. The records are unclear as to exactly why the ship sank, but they show that she burned while sitting on the reef for some 13 hours before landing upside down.

Leaving the rear engine room, Sari and I swam along a narrow passageway framed by the ship's huge boilers on the starboard side. Ahead was a gigantic crack where a weakened, burned hull had broken upon settling. Thousands of glassy sweepers now made this crevice their home. Off to the left, the flattened wheelhouse is no longer a recognizable part of the ship; but two masts, one of them still supporting the crow's nest, lie unnaturally on the bottom. Entrance into the forward hull section is possible, but it's a tight squeeze. Since the forward two-thirds of the ship burned as the rear third was sinking underwater, most dives take place in the stern.

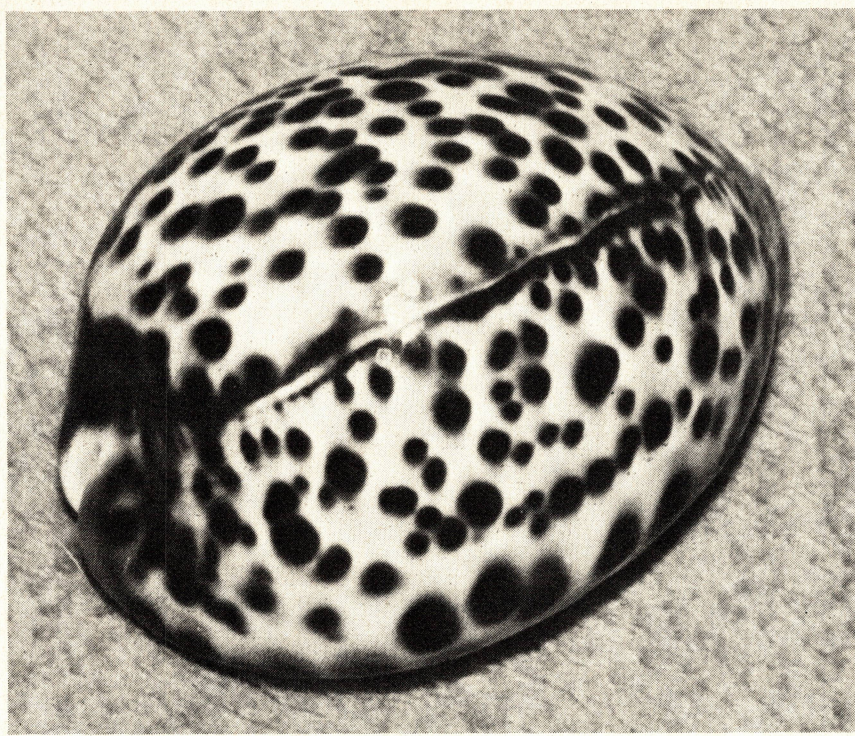
Having made a complete excursion around and throughout the 297 foot ship, Sari and I headed back to the stern where Howard was emerging with a basketful of goodies. He had located the wine cellar on this dive and had found three or four bottles with the corks still intact. Later at the diving center, Howard set up all of the artifacts he had retrieved. Porcelain plates with the crest of the *Dunraven* etched in time by the sea, made an impressive display. Fancy glass medicine jars have taken on an elegant patina. Bottles of rhubarb, currants, and olives easily transport one 103 years back into the ship's galley. Brass port-holes, doorknobs and coat hangers, along with exquisitely fashioned dragon lamp holders, are also part of this interesting collection.

The *Dunraven* is like a private playground to Howard. Because of its remote location, he has been one of the very few to dive it. But when he does, he usually takes along a group of diving guests. This section of the Sinai (immediately adjacent to the Shard Ali Reef) has been returned to Egypt. Whether or not Howard will be able to take divers out to see the *Dunraven* is uncertain. 🐟

The *Dunraven*, a merchantman that plied the trade route between India and England, sank in the Red Sea prior to 1880. She now lies in 90 feet of water in the Shard Ali Reef in the Gulf of Suez.



illustration by Shlomo Cohen



photograph by Bonnie J. Cardone

Hiding in some cave or crevice is a marine mollusk with a price on its shell. The creature is a tiger cowry, *Cypraea tigris*, and the reward for its capture is several thousand dollars. But the desired shell is not any run of the mill tiger, it is a Guinness Book cowry, a monster of its species. In this case the biggest is the best among serious shell collectors, and some lucky diver may chance upon this King Kong cowry. The biggest cowry on record is a six-incher; it has a \$2,000 price tag.

Tiger cowry shells look as if they were fashioned out of fine Chinese porcelain. The egg-shaped shells are honey brown to burnt amber in color, and are overlaid with big freckles. The luster of its shell would seem to make it a standout on any reef, but the cowry is a modest creature and usually cloaks its beauty with a fleshy fold of skin known as the mantle. The mantle has a marbled pattern studded with nubs like a rubber bath mat. This pattern helps the animal to blend in with its natural background.

The mantle does more than just camouflage the shell, it is also responsible for building the shell. The blood in the mantle is rich in liquid calcium, this in turn is secreted in the form of calcium carbonate on the exterior of the shell. The mantle also protects the shell against abrasion, repairs any cracks and keeps other organisms from growing on the shell.

The largest cowries in the world are found in Hawaiian waters. Both the record breaking six-incher and a recently discovered five and fifteen-sixteenths inch specimen were found off the island of Oahu. You should concentrate your

Tiger Hunting in Hawaii

By Jim Wiltens

hunting on rocky areas with numerous clefts and caves, in depths between 10 and 80 feet. Cowries usually retreat to the seclusion of some dark crevice in the daytime, making them particularly difficult to find. At night you will have your best luck when the tigers prowl over the reef in search of food.

While searching for a mammoth cowry you may chance upon a life and death struggle between a tiger and one of its natural enemies. The octopus and certain species of cone shells are especially fond of cowry snacks. On contact with an octopus, the cowry immediately withdraws its foot and mantle. You would think the cowry was safe within its fortress, but the octopus has a venom which it injects into the opening on the underside of the shell. Then it uses a tentacle or its tongue to scrape the fleshy parts of the animal out.

Another mollusk, the cone shell, also puts tigers on its grocery list. Chemical

receptors in a cone's siphon, similar to a nose, alert it to the presence of a cowry. The cone may then try to get close enough to jab a poison tipped dart into the cowry, causing rapid death (some cones are also dangerous to humans). But cowries are equally sensitive to the presence of cones and can easily outdistance them. The cone's best chance is to corner the cowry, or be down current so the cowry doesn't detect it.

This adds up to three species out hunting tiger cowries; the octopus, cone, and diver. If you are fortunate enough to find a big tiger, then measure the base of the shell in a straight line along the longest axis. If you can keep the cowry alive then by all means do so, but if you decide to keep only the shell then remove the animal as soon as possible. An easy way to clean a large cowry is to put it in a bucket of sea water with several large cones such as *Conus textile* or *Conus striatus*. The cones will often do all the work of cleaning in less than a day.

An alternate cleaning procedure is to:

1. Cool your shell in a refrigerator crisper. After several hours transfer it to the freezer compartment and freeze it overnight. Sometimes freezing will crack a shell or put craze lines in the enamel, but the pre-cooling usually prevents this.

2. Take a thin tool and clean the shell through the slit on the bottom. I find a curved tine from a bamboo garden rake works well.

3. Place the shell over an anthill, out of the sun. The ants will take care of anything you missed.

4. Rinse the shell and apply a thin coat of mineral oil. 

Buddy Diving

only for the lonely?



photograph by Nancy Sefton

By Dick Anderson

On a recent trip to Chicago I had a chance meeting at the airport with a highly respected, notable and articulate diving Ph.D. His association is with the U.S. Government and my association is mainly with myself. We had a friendly but lively discussion while waiting for planes in a comfortable VIP lounge. I will not mention the man's name because I really don't know him well enough to be attuned to his whole philosophy, and a condensation of one segment of his outlook could be considered somewhat out of context. Besides, I like the guy and he can tell his own story if he wants.

The topics of conversation were mainly limited to buddy diving and decompression diving. I shocked him with my candid views on buddy diving and he shocked me with his views on decompression diving related to sport divers.

My feelings on buddy diving are rather basic and refer to my individual preference. I'm not going to say what I think is good for the nation, other divers can decide for themselves about that — or get it crammed down their throats. I'm only talking about what I prefer for me. Personally.

I think buddy diving is a pain in the butt. I would rather dive alone and die alone. And I probably will. That's the way I want it. I consider it my human right to use my fragile human body any way I see fit. If I want to dive in a manner

that some experts consider contrary to their views of safe diving practice that's my business. I do not want to have buddy diving crammed down my gullet because a panel of experts, with diving credentials and little diving, believe it is good for the masses. It may be good for the masses but it's not good for me. I alone can be the best judge of that.

I'm not against buddy diving. In fact I'm all for it. If that's what people want to do so much the better. A lot of people are more comfortable with a buddy. There have been many times when I was quite happy with the presence of a diving buddy. There have been other times when I wished I had one. But that should be my option. It is my right to choose the mode to suit the situation. It should be anybody's right. If someone wants to dive alone it is his right to do so — even if he drowns doing it. And if you think buddy diving is a guarantee of longevity, think again. It's my guess that the statistics on buddy diving deaths would shock even that panel of experts. I don't think you'll ever see those statistics. They might prove contrary to what the experts think is good for the masses.

Here's what I have against buddy diving. This is my opinion, for me alone, and not a general recommendation. Buddy diving requires two men to do the work of one. In a dangerous situation it imperils two lives instead of one. In a working dive, putting two men down to perform the work of one is costly. If it's really a

one-man job, the working diver is trying to do his work and keep an eye on his buddy at the same time. It's inefficient, annoying and dumb.

In sport diving, buddy diving only works best if neither diver has the experience to feel at ease down there. Usually buddy diving has a dominant diver and a subordinate diver. The dominant diver does what he wants and the subordinate diver follows, hovering here and there, humming to himself. If both parties are happy with this, fine. But a subordinate diver doesn't stay that way. Sooner or later he's going to say to himself, "Why am I following this loudmouth all over the place; I think I'll grab my own lobster." Unless you're sight-seeing, sport diving is just a lot more fun, and far more relaxing, when you do it alone.

Well, that is the essence of my side of the conversation with the diving Ph.D. I would say he was clearly shocked. He really didn't offer any protest. There wasn't time, and I don't think he had ever heard such candid outrage before. He was a little awed by such diving arrogance.

If the Ph.D. was somewhat awed by my views I was really frightened by his views on decompression diving for sport divers. His solution was a simple one. Eliminate all decompression dives for sport divers. Solve the problem by eliminating it. There is no valid reason for a sport diver to descend to a depth requiring decompression. A sport diver

should be content to dive in shallow water where most of the attractions are anyway. Don't teach decompression, no tables, no meters, no problem.

I didn't offer any protest to what he said. There wasn't time, and I was sort of overwhelmed by the implications of what I had just heard. I was speechless.

I'm not sure I have my finger on the pulse of the American diver but I have a feeling that most divers would object to a no-decompression-dive restriction. But here's the part you have to understand. The man who put this forth is a really good man, he's a thoughtful man, he has a genuine interest in the safety of the diving public. But he's government. Government is a friend of the masses and an enemy of the individual. The government would only be happy if we were all to spend each weekend sitting on an aluminum chair in a U.S. Forest Service campground listening to the ballgame and wearing hard-hats for protection against falling pine cones.

Well, our flights were announced so we shook hands and departed. I admired this man a lot but I had to regard his dive philosophy as a threat to my individual liberty. I don't know what he thinks of me overall but I do feel he regards my dive philosophy as a threat to the safety of the diving masses. Perhaps so, but I prefer individual freedom over safety by restriction. Nothing man has ever achieved was accomplished in perfect safety — that includes the formation of this government that wants to protect us whether we like it or not. 🐬



Editor's Note: The preceding article does not necessarily reflect the views and philosophies of SKIN DIVER Magazine. However, in view of this writer's many years' experience as both a commercial and a sport diver, as well as his present status within the industry, it is felt that his personal opinions and observations merit publication. The author offers a viewpoint which is, indeed, radical and obviously controversial. It is up to you, the reader, to make your own personal decision as to the validity of his diving philosophy.

Film Festivals 'n Symposiums

NAUI'S UNDERWATER '80

The Fall Edition of Underwater '80 is scheduled for September 27, 1980, at John Hancock Hall, Berkeley Street, Boston, Massachusetts. Beginning at 10:00 am and continuing through until 5 pm, the Underwater Symposium (produced in cooperation with the South Shore Neptunes Inc.) will present a series of lectures augmented with slides and films on various topics. Leading authorities in the fields of marine biology, U/W photography, instrumentation for the marine environment, equipment for marine studies, and many more will present this fascinating series.

At 8:00 pm Fred Calhoun will present the Underwater Film Review. Emceed by Lewis Wilkie, the program will feature the films of LeRoy French, winner of numerous awards for his U/W cinematography. Also scheduled is *Sentinels of the Sea*, *Sonnets to a Reef* and Dean Westgaard's *Parascuba*. Tickets for the Underwater Symposium, \$4 each, and the Underwater Film Review, \$4 each, may be acquired at the door on the day of the program, or in advance at the box office, or by writing Fred Calhoun, PO Box 291, Back Bay Annex, Boston, MA 02117. Make checks payable to NAUI. 🐬

CAYMAN ISLANDS PARTY

The fourth annual Cayman Islands party will be held September 20, at the Astro Village Hotel, 2350 South Loop West, Houston, Texas. The evening's entertainment will feature the Barefoot Man and his band, Andy Martin, Harry, the fire and limbo dancer, and U/W movies. The party starts at 8:00 pm, and hors d'oeuvres will be provided. Tickets are available at \$7 per person, or \$5 per person for groups of ten or more. Write to The Cayman Island Party, Box 1249, Grand Cayman, BWI for tickets or information. 🐬

VISION 360

The Third Annual Vision 360 International Diving Symposium will be held Saturday, September 20, at Buffalo State College, 1300 Elmwood Avenue, Buffalo, New York. The program is produced by the NAUI Buffalo Chapter and is a day long event featuring a series of seminars. The Underwater Symposium will run from 11:00 am to 5:00 pm. The Underwater Film Festival will begin at 8:00 pm and will feature a variety of the latest films. All events will take place in the Communications Center.

With the 1980 show, Vision.360 will host its first annual underwater photo competition. All entries will be displayed

at the symposium and awards will be presented at the evening film festival. Deadline for entries will be August 15. Tickets for the symposium will be available at the door or in advance. For information or tickets contact Dallas Edmiston, director, Vision 360, P.O. Box 842, Buffalo, NY 14221. 🐬

MCKENNEY TO ROCKFORD

Jack McKenney, adventure editor of SKIN DIVER Magazine, and well-known underwater photographer, will be the feature presenter at the fourth annual film symposium hosted by the Rockford Divers Association. Jack will be showing *The Underwater World of Florida* and *The Underwater World of California*.

The show will be held October 24, at the South Beloit, (Illinois) Holiday Inn. Doors will open at 7:30 pm with films beginning at 8:00 pm. Tickets are \$4 per person and only 300 will be sold. The following day, the dive club will host a wreck diving symposium and artifact display. For information or tickets contact: Bill Steinborn, 1385 Randall Drive, Rockford, IL 61108. 🐬

TZIMOULIS AT CENTRAL

Central Skindivers of Bellmore, New York will host a special event in celebration of their 28th anniversary, August 9th and 10th.

The festivities will begin with an U/W film festival on Saturday evening, August 9, at the Hofstra University Playhouse, Uniondale, NY. The theme of this unusual show will be, An Evening With Paul Tzimoulis. Mr. Tzimoulis will appear in person and show a variety of selected U/W films from various adventures



around the world. In addition, Mr. Tzimoulis will present several sound/slide shows on U/W photography. The admission fee for the evening performance will be \$2 per person, and tickets are available at Central Skindivers or at the Playhouse box office.

On Sunday, August 10, Central Skindivers will host a celebrity dive trip off the south shore of Long Island on their 60 foot dive charter boat. A special contest will be held to choose the 24 lucky winners who will have the opportunity to dive Long Island wrecks along with SKIN DIVER Editor/Publisher, Paul Tzimoulis. Contest entries are limited to certified divers 18 years or older. Entry blanks are available at Central Skindivers, 2608 Merrick Rd., Bellmore, NY 11710. For more information you can call "Honest Archie" at (516) 826-8888. 🐬

The Greater Amberjack

(*Seriola dumerili*)

The jacks are swift, strong, silvery fishes that roam the open sea. Normally they will only swim into a reef area to feed on other, smaller fishes — many of which become easy targets for the predator's unexpected, lightning-quick strikes. Jacks belong to the fish family Carangidae, a diverse group which also includes scads and pompanos. The body shapes of the carangids can range from the extremely deep lookdown, *Selene* to the shallow-bodied scads, *Decapterus*. While all of them appear quite different, they have several common characteristics: Slanting foreheads, deeply forked tails, and a pair of anal spines just in front of the anal fin. These spines can lie flat in a groove and so will not always be apparent. While the anal spines are the most positive means of identification, the shape of the head and the forked tail is usually enough for a diver to distinguish the jack family. □ Amberjacks are large

carangids with moderately deep bodies. *Seriola dumerili* is the most common species of the genus in the tropical western Atlantic and it is one of the largest of the Atlantic carangids. The fish has been recorded over five feet in length, and one individual reportedly weighed in at 177 pounds. The greater amberjack is very similar to the almaco jack (*S. rivoliana*) — another west Atlantic amberjack. *S. dumerili*, however, has a shallower, sleeker body. Its coloration is distinctive: Light silvery gray with a dark brassy band that runs from the snout through the eye, to the nape. The almaco

jack also has this nuchal band, but its overall body coloration is somewhat darker. The greater amberjack is almost white below the band. □ The greater amberjack's scientific name is in honor of A. M. Constant Dumeril, ichthyologist of the Museum of Paris in 1910. The fish occurs from both sides of the Atlantic, in the Mediterranean as well as along the East Coast of the United States. Ichthyologists Bohlke and Chaplin have recorded *S. dumerili* from New England to Brazil, including the Gulf of Mexico, and they have noted that in the Bahamas it occurs only from the Great Bahama Bank. The

fish is usually solitary and is one of the open-ocean carangids that usually swims into reef areas only to feed. John Randall studied the voracious eating habits of the amberjack and determined that its diet is comprised entirely of fish. One 27 pound amberjack he examined had eaten seven bigeyes (*Priacanthus arenatus*), while

another 30 pound individual had eaten, in one feeding, a bar jack (*Caranx ruber*), two grunts (*Haemulon aurolineatum*), and two other sizable fishes as well. □ Young carangids are typically banded. Jacks are believed to spawn offshore, and for a time the young drift in the plankton currents of the open ocean; usually in the protection of sargassum weed, within jellyfish tentacles, or under floating bits of wood or debris. When they reach a certain size the tiny fishes drift inshore, lose the banded pattern of youth and begin to forage on the reefs like the large adults. »

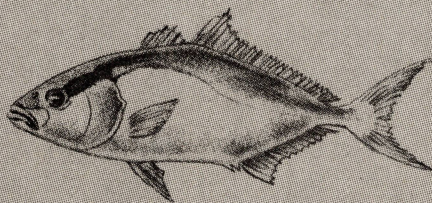
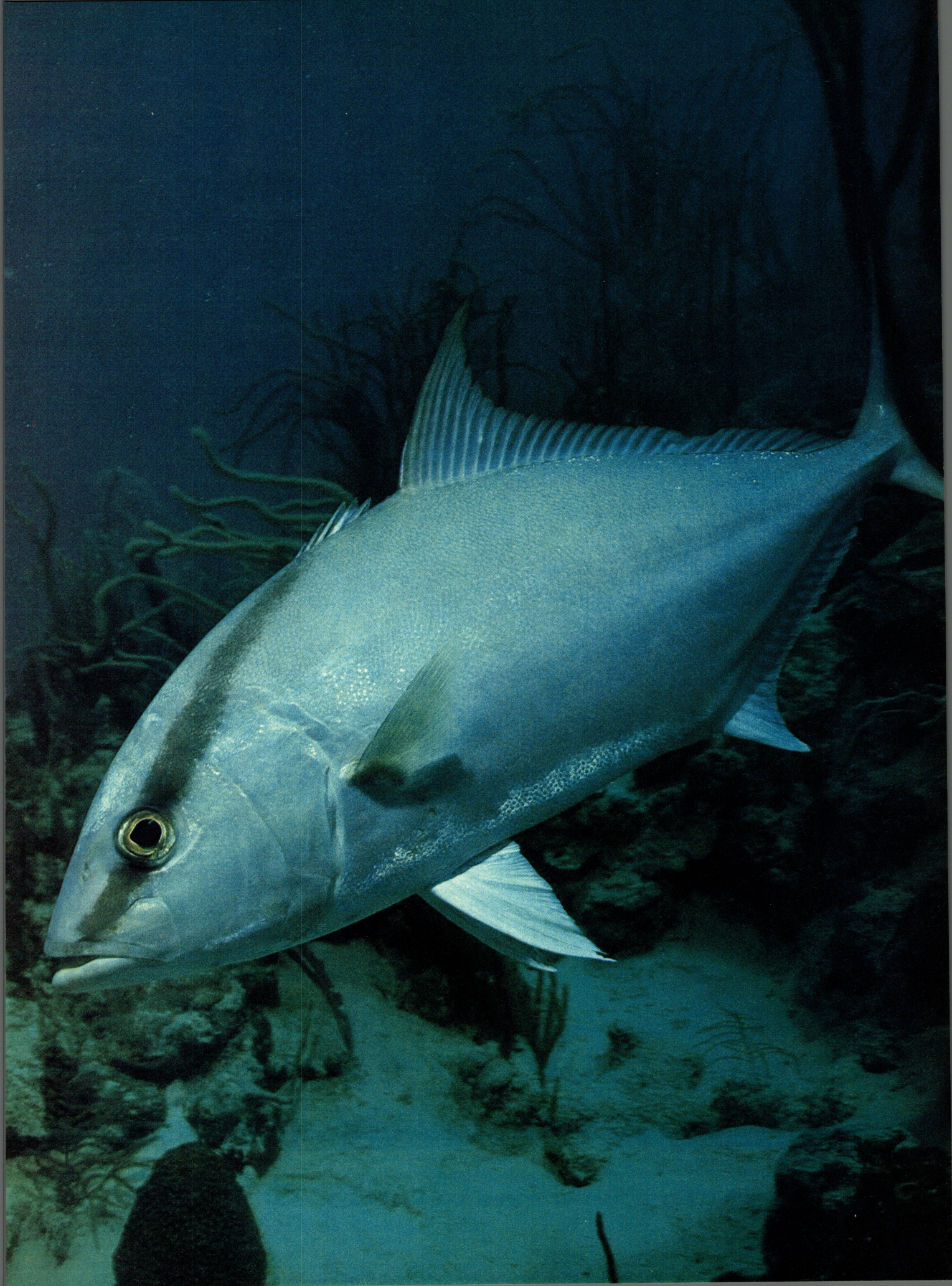


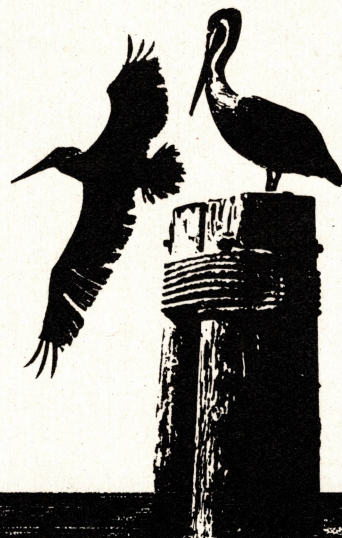
Photo By George Marler - Text By Hillary Hauser

The photograph was taken in 45 feet of water off Peter Island, British Virgin Islands. Marler used a Nikonos with a Seacor 21mm lens, Subsea Mark 150 strobe. Shot at f16, 2 feet from the subject, Kodachrome 64 film.

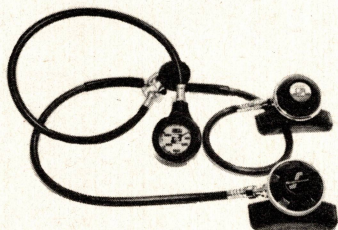


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Scuba Quiz

Category: Squeezes

By Dennis Graver

The direct effects of pressure can cause pain and injury to a descending diver. With knowledge and skill, discomfort and bodily injury can be prevented. Test your knowledge of the various squeezes with the following questions. Answers are on the next page.

1. A squeeze occurs when:

- ☐ A. The pressure inside a rigid air space is less than the pressure outside
- ☐ B. The pressure inside a rigid air space is greater than the pressure outside
- ☐ C. The pressure inside a rigid air space is equal to the pressure outside
- ☐ D. The pressure inside a rigid air space varies with the pressure outside

2. A mask squeeze tends to:

- ☐ A. Push the diver's eyes into their sockets
- ☐ B. Push the diver's eyes outward into the mask
- ☐ C. Distort the mask lens and cause blurring of vision
- ☐ D. None of the above

3. Pain felt above and behind the eyes during descent would most likely be caused by:

- ☐ A. Mask squeeze
- ☐ B. Sinus squeeze
- ☐ C. Inner ear squeeze
- ☐ D. Descent headache

4. If a descending diver delays ear clearing until after the pain occurs, he or she:

- ☐ A. Will need to blow much more forcefully than normal to clear the ears
- ☐ B. Will be unable to clear the ears until the pain has been relieved by ascending
- ☐ C. Will need to use some means other than valsalva in order to clear the ears
- ☐ D. Will need to surface and reinitiate the descent

5. A diver experiences continuous sinus pain during a descent to 50 feet. The pain subsides after ten minutes of bottom time. At the end of the dive, which of the following is likely to occur:

- ☐ A. The diver will experience sinus pain during ascent
- ☐ B. There will be pain during ascent, but it will subside ten minutes after surfacing
- ☐ C. The diver will have a nosebleed during ascent
- ☐ D. Any of the above could occur

6. When experiencing ear clearing difficulty, a diver attempting a very forceful valsalva maneuver can:

- ☐ A. Cause an injury that could result in hearing loss
- ☐ B. Rupture the eardrum
- ☐ C. Be assured some air will reach the middle ear
- ☐ D. Both A and B

7. If a skin diver with a maximum lung volume of ten pints and residual lung volume of two pints takes a full breath at the surface and descends, he or she will experience a lung squeeze at a depth of:

- ☐ A. 132 feet
- ☐ B. 165 feet
- ☐ C. Less than 132 feet
- ☐ D. More than 165 feet

8. Following a dive, a diver experiences tooth pain, yet has no dental problems. This situation could be caused by:

- ☐ A. A mouth and throat squeeze
- ☐ B. Biting too hard on the mouthpiece
- ☐ C. An ethmoid sinus squeeze
- ☐ D. A maxillary sinus squeeze

9. A diver with an air space under a tooth filling is likely to experience discomfort during:

- ☐ A. Descent
- ☐ B. Ascent
- ☐ C. Any pressure change
- ☐ D. None of the above

10. Select the true statement. The use of decongestants/antihistamines by divers to aid in equalization could:

- ☐ A. Cause unconsciousness underwater
- ☐ B. Trap high pressure air in air spaces
- ☐ C. Contribute to decompression sickness
- ☐ D. Cause any of the above

Scuba Quiz

Answers: Squeezes

1. A. The pressure inside an air space is less than the pressure outside. In a squeeze, the initial pressure in an air space remains unchanged, but its pressure decreases relatively as ambient pressure increases. The body transmits pressure freely to internal air spaces. Unless air is admitted to the spaces to equalize increased pressure, pain and injury will result.

2. B. Push the diver's eyes outward into the mask. Since the pressure in an air space decreases relatively in a squeeze situation, there is a tendency to compress the air space. Minute capillaries in the conjunctival membrane that overlies the eyeballs become engorged with blood and may rupture during a mask squeeze because of the effect just described.

3. B. A sinus squeeze. The frontal sinuses are located above the sphenoid sinuses behind the eyes. They connect with the nasal passages through small openings. If these openings are plugged or swollen shut, sinus squeeze will occur and injury can result.

4. B. Will be unable to clear the ears until the pain has been relieved by ascending. With the eustachian tube, which connects the middle ear and the throat, closed, middle ear pressure will become negative during descent. With increasing pressure, opening of the tube becomes more and more difficult until a pressure is reached at which it is impossible to open the eustachian tube and equalize pressure in the ear.

5. D. Any of the above could occur. As already explained, a squeeze causes rupturing of capillaries in body air spaces. In a sinus, bleeding into the space reduces the volume and equalizes the pressure. Pain eases when equalization occurs. During ascent, the air in the space will attempt to expand to its original volume, but, due to fluid in the space, cannot. Pain returns until the fluid can be eliminated and the pressure relieved.

6. D. Both A and B. Inside the ear are two windows in the hearing organ. These windows are membranes that flex inward and outward to transmit vibrations to the auditory nerve from the eardrum. Blowing forcefully against blocked nostrils can rupture these membranes and surgery may be required to correct the damage.

7. D. More than 165 feet. Lung squeeze is theoretical and unrealistic. Breath-hold divers have descended to 300 feet without experiencing the malady! Blood shifting from the extremities to lung capillaries, plus other physiological reactions, make this textbook diver's disease a myth.

8. D. A maxillary sinus squeeze. These sinuses are located just above the palate, and the roots of some teeth extend quite close to the sinuses. Air attempting to expand in a blocked maxillary sinus can exert pressure on a tooth nerve and cause discomfort.

9. C. Any pressure change. With an improperly filled tooth, air may seep slowly into an air space under the filling during periods of increased pressure. This isn't a problem until the pressure is decreased and the air under the filling increases its pressure because the air cannot expand — ouch! During periods of increasing pressure, squeeze can also force pulp into the air space, causing pain.

10. D. Cause any of the above. In addition to causing drowsiness and possible unconsciousness, decongestants can also alter physiology and contribute to decompression sickness. Further, passages opened by drugs can close tighter than ever when the medication wears off. This rebound effect could cause high pressure air to be trapped in ears and sinuses. If you are not well, don't dive.

I hope you are not apprehensive about diving as a result of reading about all the terrible things caused by squeezes. The idea of this exam is to bring out the point that if you are healthy and don't force equalization, squeezes will not be a problem. Also, clearing becomes easier with experience and frequent dive activity. May you have clear ears and water!

CREDENTIALIALS

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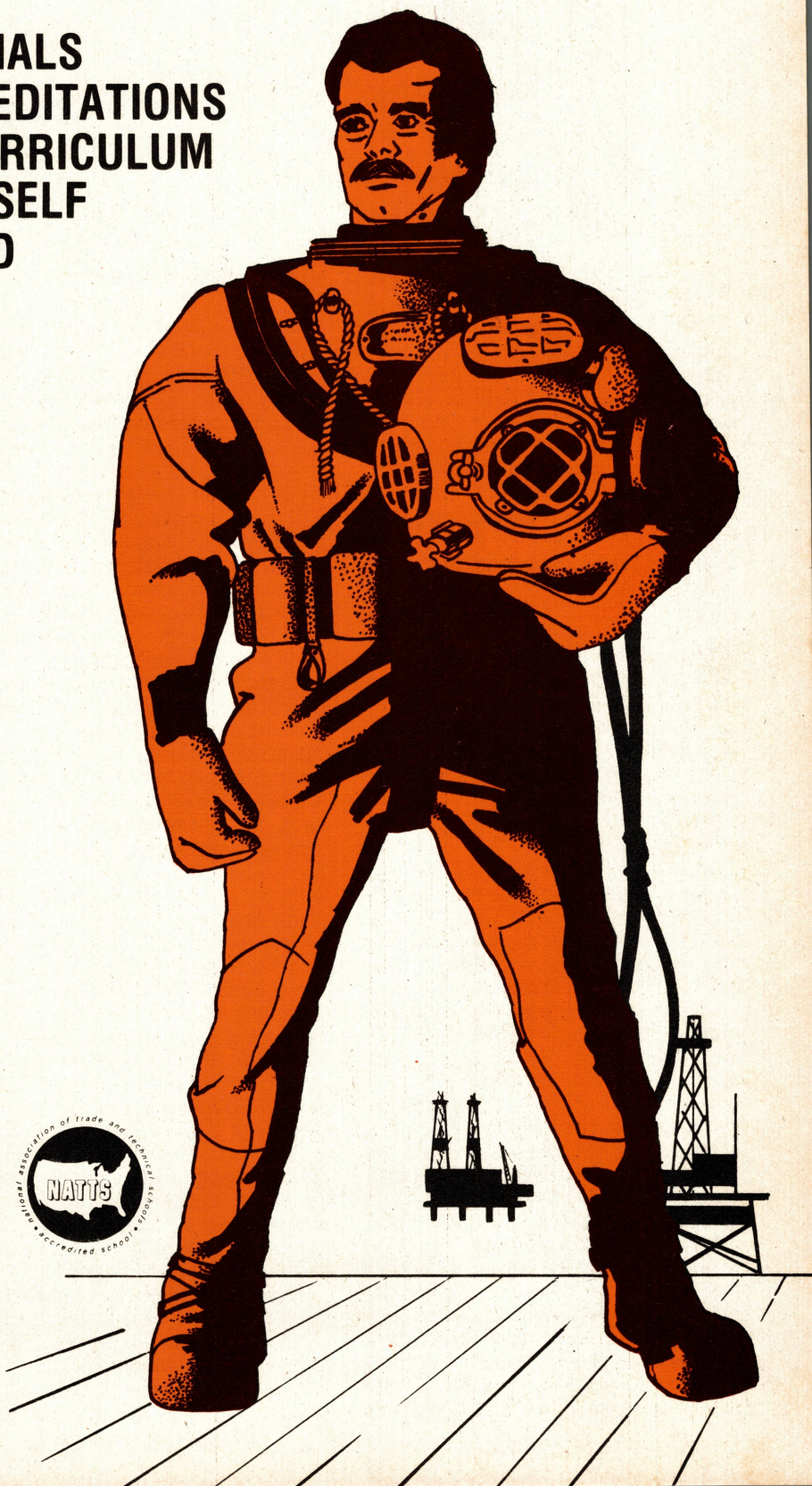
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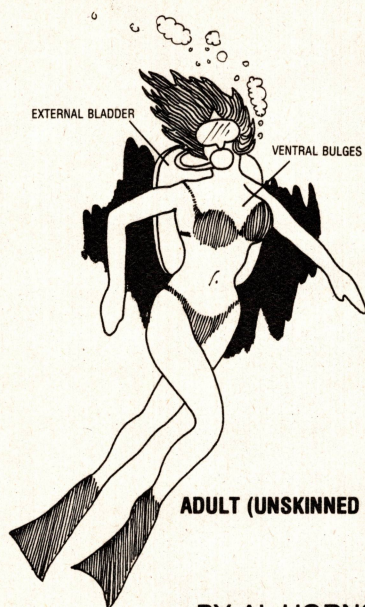
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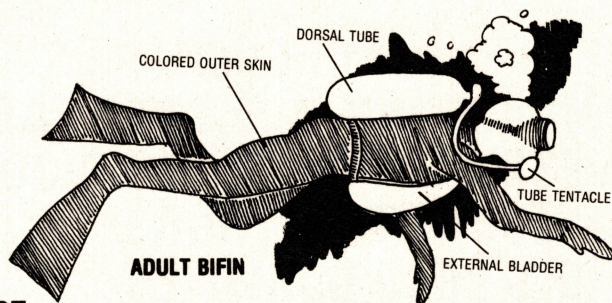




ADULT (UNSKINNED VARIATION)

BY AL HORNSBY AND JOHN MOORE

THE BIFIN WATCHERS GUIDE



ADULT BIFIN

illustrations by John Moore

bi • /bi-fin/n: a part-time water animal; esp: any of a strange group of warm-blooded, bubble-emitting vertebrates with two long tail (caudal) fins, two slender pectoral appendages, a large dorsal tube and a single clear eye; having the mysterious habit of suddenly appearing near the surface or in the shallows, and after brief periods of time, inexplicably disappearing in similar fashion.

As yet, knowledge about the unusual animal, *Bifinus spazus*, or more commonly, the bifin, is sketchy and incomplete. Theories concerning origin and habit differ markedly among the experts, though future research will surely unravel the mysteries.

LIFE CYCLE

The life cycle of the bifin apparently involves three distinct phases; juvenile, adolescent, and mature adult. The juvenile *Bifinus*, until recent years, was the only bifin phase known to researchers. It seems to be almost totally restricted to the shallows and is usually seen in small groups. Sizes range from about two fins to six fins in length. The juvenile bifin tips the scales from 20 to 300 pounds.

The juvenile phase is easily identified by the smooth coloration; usually a drab white, tan, or chocolate with one or two narrow bands of variable color about the body. In rare instances, especially in colder regions, a thick outer skin of black or other color may be seen.

Adolescents of the *Bifinus* species are distinctive and therefore easily distinguished from juveniles. The most apparent change is the emergence of a single, clear eye in the middle of the head. Specimens are reported having two smaller eyes, side by side, but less com-

monly. The adolescent phase also features a single, rigid cheek spine of varying color, located on the left side of the head. It is assumed the spine bursts forth fully developed — a short or partially grown spine has never been documented.

The adolescent bifin first exhibits full growth with the appearance of two dark caudal fins. Only rarely appearing useful for locomotion, these fins are thought to be an alarm mechanism as they are typically beaten wildly about the surface in times of excitement or duress.

At some unknown point in the *Bifinus* life cycle, the adolescent undergoes a massive physical change. A thick swelling along the spine forms one or (less commonly) two large, dorsal tubes. The function of the organ(s) is unknown; it has been documented that tubes are shed, then replaced or even discarded at will. The dorsal tubes vary in color, and are seen in blue, yellow, silver, orange, black, gray, white and other shades.

From the dorsal tube, a single black, flexible tube-tentacle extends forward to join at the head, just below the eye. This juncture is the source of the noisy, escaping gas which has earned *Bifinus* the nickname, "Bubble Bifin." In cases, double tube-tentacles have been reported (with bubbles escaping behind the head), but such sightings are rare.

Other body growths may be noted including a soft, external bladder of varying colors. Located around the head or attached to the dorsal tube, the bladder is thought to be a food pouch and may shrink or swell periodically.

Most adult bifins have the colored outer skin growth, but an occasional unskinned individual will be seen. The most common unskinned variation also has strangely over-developed ventral bulges located between the pectoral appen-

dages. Such specimens are generally marked with two tiny bands of bright coloration about the torso. The function of the structures is unknown, but it has been proposed that they are used in communication or teaching; most other adult bifins seem to study the graceful, ventrally-bulged individuals.

SUB-SPECIES

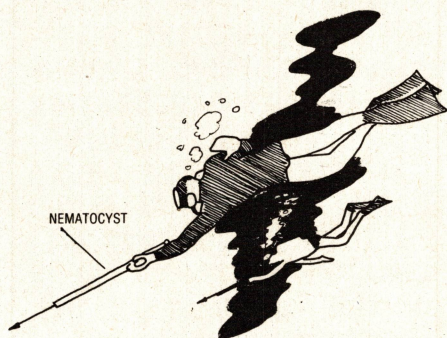
Several *Bifinus* sub-species may be noted by the interested bifin-watcher. Each group shows distinct differences in both body structure and behavior, the most common types being: *Bifinus megaspazus*, the turkey bifin; *Bifinus instruspazus*, the herdmaster bifin; *Bifinus machospazus*, the killer bifin; and *Bifinus photospazus*, the electric bifin.

The turkey bifin is similar to the normal adult, but positioning of the major limbs is noticeably different. One may note the squat, rather stiff posture, and an erratic flapping and thrusting of the caudal and pectoral appendages. Generally accompanying groups of turkey bifins will be one or more *Bifinus instruspazus*, the herdmaster bifin. This sub-normal adult bifin is noted for its second tube-tentacle and its unnatural obsession for the *megaspazus* individuals — it either herds or merely follows them about endlessly.

Though most bifins are considered harmless or even playful in their own dull manner, one common sub-species, *Bifinus machospazus* (the killer bifin), is quite dangerous and should be avoided. The killer bifin develops a long efficient nematocyst, generally extending from the right pectoral appendage. Both adults and juveniles have been responsible for numerous fatalities among fishes, by "bifin-bite," "bifin-attack," or "bifin-frenzy." The current public obsession with these beasts (especially the deadly

great white bfin) can be noted by the proliferation of tales concerning them; *Hands* and *Hands II* having been major net-office hits.

The most appealing bfin sub-species is undoubtedly *Bifinus photospazus*, the electric bfin. This group is most easily recognized by the elongated, phos-



KILLER BFIN (BIFINUS MACHOSPAZUS)

phorescent appendages and a second mobile eye formed on the ends of the pectoral limbs.

Photospazus is best known for its bizarre behavior. While swimming or crawling about, the second eye is frequently brought near the head, strange whirrings or clicking noises occur, and intense orgiastic flashings suddenly erupt. The flashes are thought to be the result of voyeuristic excitement.



TURKEY BFIN (BIFINUS MEGASPAZUS)

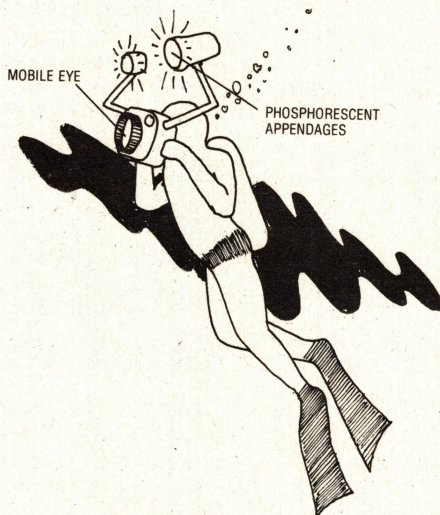
REPRODUCTION

Sighting of reproductive behavior in the adult *Bifinus* have become quite common, and some shallow coastal areas appear to be used chiefly for that purpose. Reproduction seems to occur almost exclusively among groups of turkey bfinns and herdmasters, but has been observed in all adult types.

The mating sequence is generally initiated by the herdmaster bfin when it places itself directly in front of a submissive *megaspazus* individual. After pointing at the turkey bfin with one pectoral

appendage, then drawing the appendage across its own lower neck region, the herdmaster waits impatiently. As the turkey bfin repeats the symbolic gesture, excitement consumes both partners. As the *megaspazus* detaches its tube-tentacle from its own head, while exuding a steady stream of small bubbles, the herdmaster quickly offers its second tube-tentacle (or primary if only one is present), which is then taken by the turkey *Bifinus*. After several such ritualistic exchanges, the union is complete.

So strong is the mating drive of the herdmasters, they have been seen to couple with as many as eight to ten turkey bfinns at a single sitting! At times, the level of excitement seems to reach total frenzy; whole groups of turkey bfinns perform the act among themselves. Soon after the mating behavior, the *Bifinus* groups move toward the surface or to the shoreline and disappear. Hard, brightly colored egg-cases immediately form at



ELECTRIC BFIN (BIFINUS PHOTOSPAZUS)

the surface, some sinking to the seafloor, others floating without direction. Actual egg-hatching has yet to be observed.

CONCLUSION

In closing, it should be noted that *Bifinus* is an interesting though little-understood animal. It can be at times, playful and entertaining, at others, pathetic and dangerous. It should be treated with caution until more carefully studied.

Though somewhat below the molluscs on the intelligence scale and less talented than the other warmbloods, *Bifinus* (particularly the electric bfin) has been occasionally known to accept low-level training, particularly the trick of "bring food." Perhaps some day we may succeed in imparting to the majority of bfinns some minimal awareness of the waterworld and teach them the rudiments of civilized behavior.



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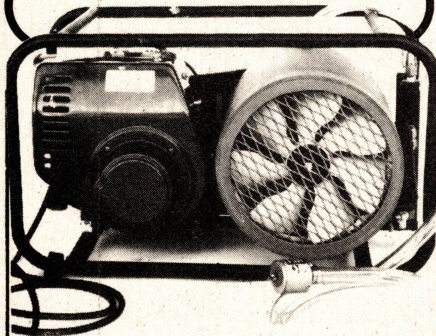
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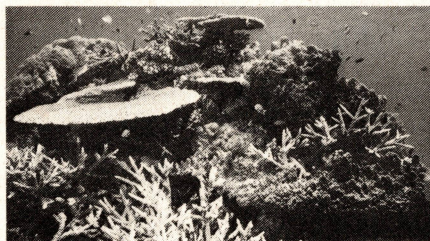
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Jack T. Marshall, proprietor of Marshall's Professional Diving Service, has a new 30 foot flattop Floteboat. Jack is currently organizing dive trips to Cayuga, Seneca, and Skaneateles Lakes. Places which were inaccessible from the shore are now within easy reach. The boat, nicknamed *Marshall's Revenge*, holds six divers.

The Finger Lakes, located in central New York, are almost as rich in history as the Great Lakes. Marshall has planned wreck, night, and exploration dives, and is available for charter when no dives are planned. Reservations can be secured by writing Marshall's Professional Diving Service, RD#3, Trumansburg, NY 14886.

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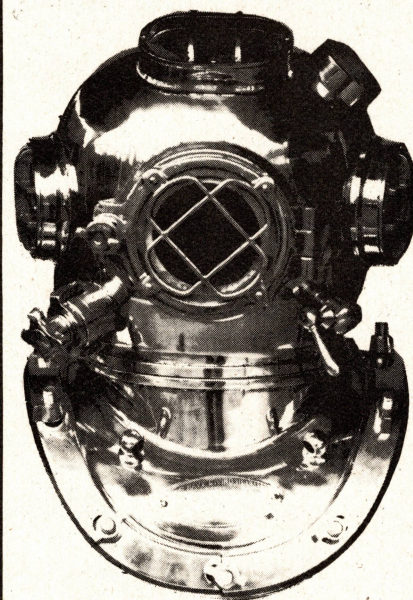
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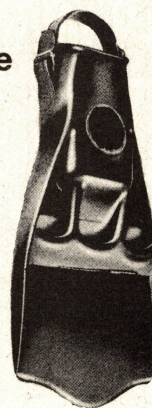
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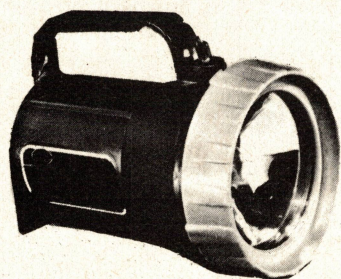
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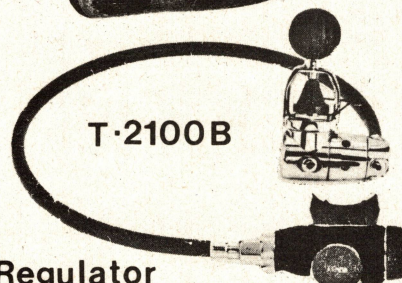
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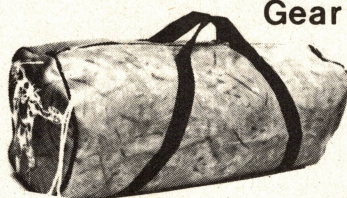
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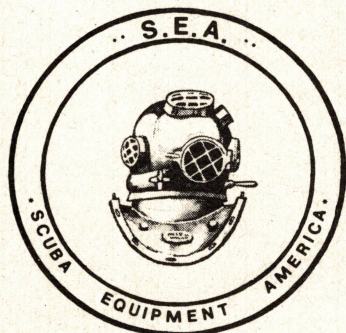


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Diving The Western End Of Long Island Sound

By Robert and Kathy Bachand

Some 8000 years ago, Long Island Sound was a freshwater lake. As the glaciers receded northward, the ocean level rose. Salt and fresh water mixed creating what is now Long Island Sound. Considering the proximity of these waters to New York and other large industrial cities, it would be easy to assume that it is a dead lake. It is anything but, as the waters harbor many beautiful and delicate marine life forms.

Limited visibility is probably what discourages many from diving the sound. With a little knowledge of the waters however, you can usually be assured of a good dive. Visibility can range from 5 to 20 or more feet, depending on the time of year, time of day, wind direction, tides, depth of the dive, recent rain and area being dived.

Many divers assume that the best visibility occurs in the dead of winter. This is partially true, as long as there has been no recent storm activity. Unfortunately, there is also much less marine life seen during the cold months. The summer doldrums of July and August often provide visibility of 20 feet or more. When the air is very still, the heat and humidity oppressive and the local radio station speaks of "electrical brown outs," that is the time for the sound.

If you enter the water approximately one-half hour before high tide, you will often experience a five to ten foot improvement in visibility as the water reaches its greatest level. Since most of the good diving at the western end of the sound is done in no more than 30 feet

and often in only 10 to 15 feet of water, even a minor chop on the surface can disturb bottom clarity. Thus, the slack current and extra seven feet of water at high tide help ensure a better dive. If the wind is producing waves of a foot or more, try to choose an area which is well protected. When there is a wind from a northeasterly direction, diving is best near the Connecticut shores. With a wind from the southwest, diving is better along the New York (Long Island) coast.

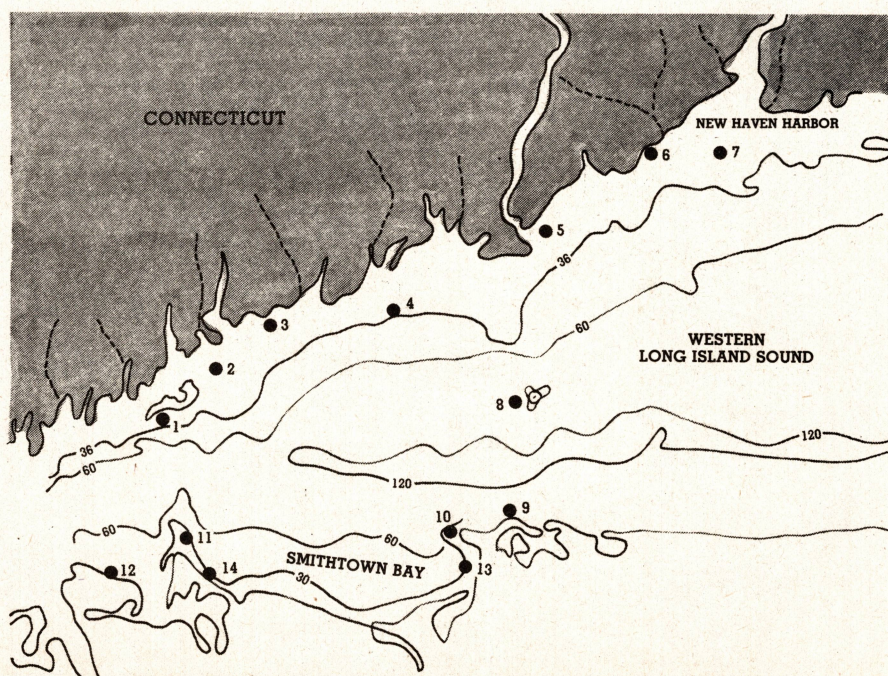
Marine life in Long Island Sound is

surprisingly plentiful. The cold water coral, *Astrangia danae*, is found throughout. The very pretty soft coral, "dead man's fingers" (*Alcyonium palmatum*), is found in deeper water. Anemones are usually always seen on the underside of rocks, breakwalls or other hard structures. An underwater light is especially useful in locating them. The rocks offshore at Anchor Beach, Milford, CT, are carpeted with the beautiful red beard sponge by late August. The site is accessible by boat or land. From shore, there is a short snorkel of 300 to 400 feet. The best time to dive Anchor Beach is at high tide with no more than a light offshore wind. Don't bother with this spot following a heavy rain.

Lobsters are particularly plentiful at the New Haven breakwall, Penfield Reef and Cokenoe Reef, especially at night. These areas however, can only be reached by boat. The breakwall at New Haven has an added advantage in that the walls are 90 degrees to each other. This permits diving on a calm side of the breakwall, no matter which direction the wind is blowing.

Larger fish, such as striped bass, bluefish and weakfish are more often seen at Middle Ground (Stratford Shoal), Old Field Point, Crane Neck Point, Eatons Neck Point and Lloyds Neck. In late summer, you may see the more unusual species in these areas, such as the roughtail stingray or some stray tropicals. Old Field Point, Crane Neck Point, Eatons Neck and Lloyds Neck should only be dived at low tide since there is always a very strong current on a descending high tide (ebb tide). Middle Ground, Eatons Neck and Crane Neck can only be reached by boat. Old Field Point and Lloyds Neck, however, are accessible by either land or boat.

Smithtown Bay often offers calm wa-





Long Island Sound is a diver's paradox: Close enough to New York City to be easy to reach, yet brimming with many beautiful and delicate marine life forms. Summer at the Sound is especially awesome; the rocks offshore Anchor Beach, Milford, Connecticut are carpeted with beautiful red beard sponges by late August.

ters when most other areas are poor. The southeast corner, approximately one mile in from Crane Neck Point, is a relatively shallow dive of 5 to 25 feet. The weed covered rocks harbor numerous pipefish, rock eels and such juveniles as the searobin. If you look under the larger rocks, you will often see perhaps the ugliest fish in the sound, the oyster toad fish. The northwest corner of the bay, just a few hundred feet from the point at Eatons Neck, offers sheltered diving when the latter spot is too rough to dive.

Wreck diving is generally disappointing at the western end of the sound. Though there are a lot of wrecks, most are difficult to find and little structure is left. Salvaging anchors is a favorite pastime for some divers. These are usually plentiful in areas where there are large rocks, such as the south side of Sheffield

Island and Cockenoe Reef.

If you are looking for a dive buddy or for further dive information, we have found Noel Voroba of Orbit Marine, Bridgeport, CT, particularly knowledgeable. There are plenty of dive shops however, along the Connecticut and New York shores. All are eager to help. Most New York and Connecticut towns and marinas maintain launch ramps for your boat. Fees vary, and complete information can be obtained by contacting area marinas or checking the *Boating Almanac, Volume #2, Long Island, Connecticut, Rhode Island*.

Long Island Sound offers good diving with a lot of interesting marine life which should not be passed up. Visibility has improved considerably in past years and with a little planning, a diver can be assured of many enjoyable dives. 🐠

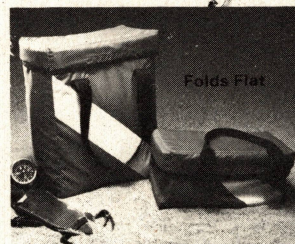
DIVE SITES: WESTERN LONG ISLAND SOUND

Site	Dive Method	Depth Range	Major Activity	Best Time To Dive	Bottom
1. Sheffield I. (south side)	boat	10-20 ft	*L & ML	high tide	rocks
2. Cockenoe Reef	boat	10-20 ft	L & ML	high tide	rocks
3. Sherwood I. (State Park)	shore	10-15 ft	ML	high tide	rocks silt
4. Penfield Reef	boat	10-20 ft	L, ML P	high tide	rocks sand
5. Stratford breakwall	boat	7-15 ft	L & ML	high tide	wall silt
6. Anchor Beach (Milford, Ct.)	boat shore	7-20 ft	L, ML P	high tide	sand rocks
7. New Haven breakwall	boat	10-40 ft	L, ML P	high tide low tide	wall sand
8. Middle Ground Stratford Shoal	boat	15-40 ft	L, ML P	high or low tide	rocks sand
9. Old Field Point	boat shore	10-30 ft	ML & P	low tide	rocks sand
10. Crane Neck Point	boat	15-35 ft	L, ML P	low tide	rocks sand
11. Eatons Neck	boat	10-30 ft	ML & P	low tide	rocks sand
12. Lloyds Neck	shore boat	10-35 ft	L & ML	low tide	rocks sand
13. Smithtown Bay (SE corner)	shore boat	5-25 ft	ML & P	high tide	rocks sand
14. Smithtown Bay (NW corner)	boat	10-25 ft	ML & P	high tide	sand, some rocks

*L=Lobstering ML=Marine Life P=U/W Photography

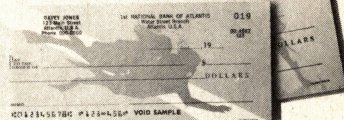
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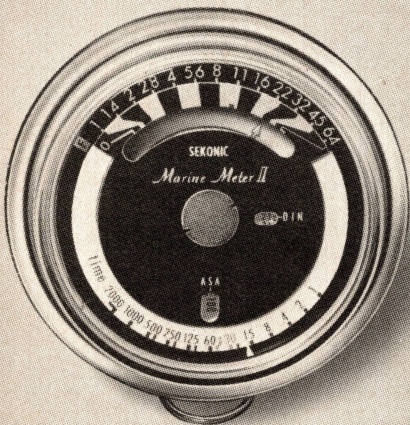
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Sekonic's 164B Marine II—a unique CdS meter built for underwater photography. Durable case is water- and pressure-resistant to a depth of 200 feet. Fluorescent dial; large knobs for easy adjustment with gloved hands. Can also be used in rain, snow or normal conditions. Complete with leather case and chain. Under \$150. At photo dealers or dive shops everywhere.



For information write:
COPAL CORPORATION OF AMERICA
58-25 Queens Blvd., Woodside, N.Y. 11377
Tel: 212/672-9100

SAN JUAN TO TORTOLA

New commuter air service has been instituted for travel between San Juan and Tortola. Effective May 1, Dorado Wings offers four round-trip flights daily between San Juan and Tortola's Beef Island Airport, with service provided by Jet Stream turbo-prop planes.

MV IMPOSSIBLE DREAM STANDS BY

In May, the U.S. Government requested the *M/V Impossible Dream* to stand by for possible use to pick up Cuban refugees legally and safely. The U.S. Government wanted to charter boats that were certified to carry passengers on international voyages. The Government wanted to be ready if Fidel Castro approved of the screening of the refugees and the enforcement of immigration rules. The *Impossible Dream* stood by in Key West for seven days until it was official that Fidel Castro would not agree to the terms of the U.S. Government. Sea Ventures International then requested that the *M/V Impossible Dream* be allowed to resume running dive trips to the Bahamas. Contrary to some misconceptions, the vessel was never seized and never transported any Cubans.

AVICON U/W FILMS

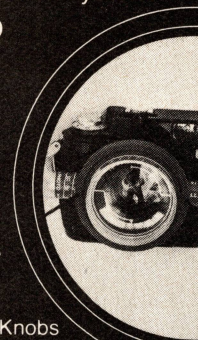
Avicon International, Ltd., an audio-visual consulting firm, has now shifted its emphasis to the underwater field. Joe Kimbell, president of Avicon, explains: "In conjunction with award-winning writer/director Ron Coley, we have made arrangements to produce a series of 16mm films for entertainment and educational



markets, as well as producing a limited number of promotional films for individual clients in the sport diving community." For information, write: Avicon International, Ltd., Lambert-St. Louis Municipal Airport, P.O. Box 10221, St. Louis, MO 63145.

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LEONARD MAGGIORE

Optician for Divers

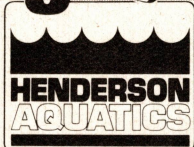
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Scuba Tech

BY E.R. CROSS

Technifacts has a new look! This column and I have been a part of SKIN DIVER for more than 15 years. During that time Technifacts concerned itself with many aspects of diving that are now covered by others. No one, however, writes about the how-to of making money while diving to defray some or all of your dive expenses.

The new ScubaTech welcomes questions and comments from readers on topics ranging from simple search and recovery problems to salvage of boats or ships; from inspections of boat propellers to inspections and reports required for offshore oil structures; from working with a snorkel to saturation rigs to JIM suits; and from commercial diving for abalone to collecting zooplankton for marine labs. That is what ScubaTech is all about — the A to Z of commercial diving.

Dive diseases, accidents, and dive medicine, as well as equipment and marine life information, will continue to be covered; primarily as related to safety in performing the particular phase of commercial diving being discussed.

The first two ScubaTechs will deal with the problems and techniques of searching for and recovery of lost items.

SEARCH TECHNIQUES

Probably the first and most frequent job a sport diver is asked to perform is that of search and recovery. Lost items ranging from false teeth to submerged cars, and from jewelry to victims of drowning accidents are sought.

In this article it will be assumed the diver hired does not have sophisticated instruments such as sensitive depth recorders, side scan sonars, magnetometers, underwater TV, pinger systems, etc. Such instruments are available only at considerable cost and will be discussed in the future.

Sometimes it seems the rules of dive safety as practiced by sport divers must be modified or eliminated in commercial diving. Such is not the case. If anything it is even more important that commercial scuba divers adhere to strict safety rules. The principal reason for this is that if dive conditions are not just right the sport diver can simply abort the dive and go home. Such is not the case for the commercial diver who must, usually, dive whether or not conditions are good or marginal.

Commercial dive safety starts with careful planning. The success of any commercial venture, but particularly a dive job, will more likely be assured if

careful planning precedes the work.

With a few exceptions, commercial scuba divers should work in pairs. The one frequent exception is when the job can best be done by one diver using a lifeline tended by surface personnel. In effect, the buddy diver is topside maintaining a watch on the submerged diver through the actions of the safety line attached to the diver. When dive conditions are very poor, such as reduced or zero visibility, surface tending becomes even more important.

Next in importance in planning a commercial dive job is laying out each phase of the job, and assigning definite tasks to each diver or group of divers. Try to select the diver best suited for a particular task. Go over the job with the divers involved in advance of the project to give them a chance to think about the work and to ask questions to clarify difficult phases of the work.

Two divers often form a search and recovery group. Almost always, more than four divers in the water at a time working from one float or in one area tends to reduce the effectiveness of the project.

Before commencing the underwater part of a search, it is advisable to establish as accurately as possible the approximate area in which the object was lost. It is usually well worth the time and trouble involved to find witnesses who may have observed the object being lost

(Continued on Page 91)

Danny's Super Summer Specials

A. Wraparound Mask \$22.00



B. U.S. Div. Rocket Fins \$22.00



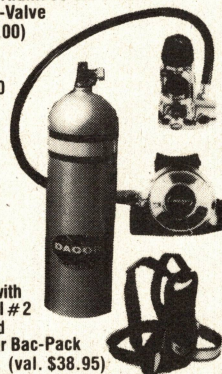
C. Ocean Pro OP101 Rechargeable Light
Lightweight, High Impact material. 3 1/2 hours of continuous light. Complete with charger.
(list \$95.00)
Danny—\$69.95

SUPER SPECIAL #1
\$104.95 Includes compass (\$24.95)
Famous Make depth gauge (\$36.95) press. gauge (\$39.95)



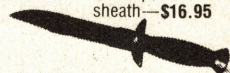
FREE WITH SPECIAL #1
PENN FORM CONSOLE III INCLUDES MOUNTING (VAL. \$19.95)

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\$271.95 Includes Dacor Pacer Regulator \$119.95 Dacor Alum. 80 cu. ft. tank with K-Valve (\$145.00) J-Val. add \$12.00



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Molded Contour Bac-Pack (val. \$38.95)

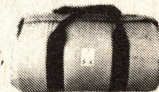
D. Knife—7" blade, butt cap. saw. & sheath—\$16.95



E. Mini Brass Diver's Mark V helmet 3" high—\$19.00



I. Deluxe Zipper duffle bag. Large 14" x 30" \$15.95



G. Famous Make Compass
fluid-filled, sealed compass capsule, rotating bezel, bold 30° Directional mark, luminescent numbers, velcro strap (list \$28.95)
SPECIAL \$22.00



F. NEW! SEA JACKET
Sea Quest Buoyancy Control Pro Jacket w/ Kam Pac CO2 cartridge & power inflator (list \$280.00)
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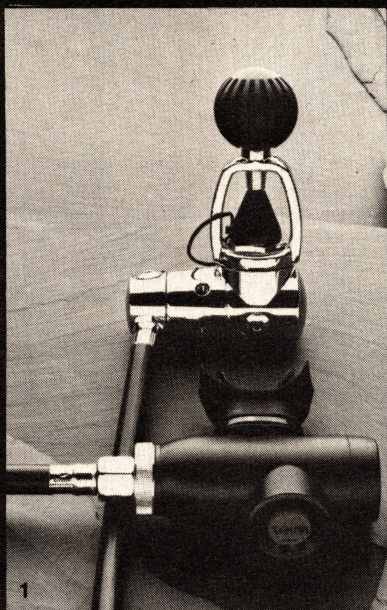
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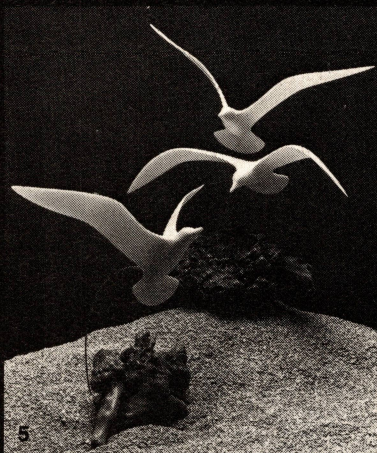
Use and operation of life support equipment should not be undertaken without qualified and proper instruction in their use. This ad does not imply the sale of life support equipment through the mail.

New Gear



1 T-2100B Regulator — Tekna's new regulator is ultralight (6.5 ounces), yet is virtually unbreakable, doesn't dent and is completely corrosion free. Self-tuning second stage never needs adjustment to maintain incredibly low breathing resistance. Priced at \$199.95 from Tekna, 3549 Haven Ave., Menlo Park, CA 94025.

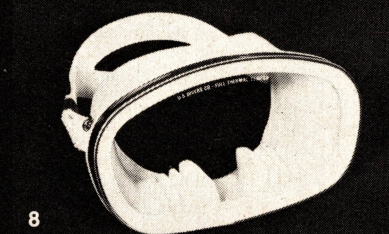
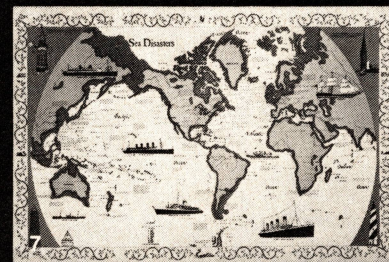
2 Wet Set Wetsuits — A new breakthrough in diver warmth, flexibility and comfort. Custom made suits for men or women in Scubaproflex and nylon. Nylon suits sized for men and women in action designed standard sizes. Matching hoods, boots and gloves. The complete line is available from your Scubapro dealer.



3 Aquarius Super Duffle — Stitched from heavy, black Cordura nylon, the bag is trimmed in red, has double-pull zippers, and durable straps with comfortable handles. It also features a large side pocket, hidden inside end pocket, three cubic foot capacity. \$36. Aquarius Mfg. Co., 60 Griffin Rd., Hudson, NH 03051.

4 Ikelite Mini C-Lite — Only five inches long and three inches in diameter, the light operates on four C batteries, yet provides four to six hours of light with twice the intensity of similarly sized lights. Priced at \$19.95, the Mini-C is available from Ikelite, 3303 N. Illinois St., Indianapolis, IN 46208.

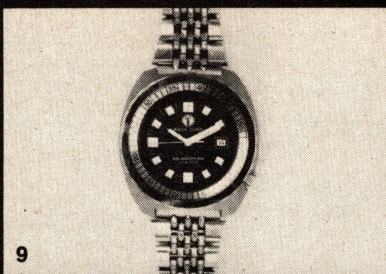
5 Pelican Gift Collection — A unique, one-of-a-kind collection of marine life sculptures made of porcelain-like Pellucida and mounted on burlwood bases. Over 30 different sculptures, including seagulls, dolphins, sharks and whales. Priced from \$15-\$100, Pelican Products, 23763 Madison St., Torrance, CA 90505.



6 SeaHawk — A full-sized vented fin with a heavy-duty buckle and strap assembly. Designed with a special soft section in the middle rib for efficient water flow. Small, medium, or large sizes, \$36 from your Mares dive store. Or write Mares, 722 Genevieve Street, Suite #N, Solana Beach, California 92075.

7 Sea Disasters-A Shipwreck Chart of the World — Over 300 major sea disasters are charted on this 23 x 35 inch decorative wall chart. Printed in full color on heavy parchment paper, the chart is \$5.95, plus 50¢ per item postage & handling. Write: Mariner Chart Shop, Little Tub Harbor, Box 9, Tobermory, Ontario, Canada.

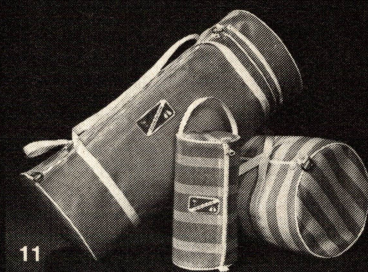
8 Silicone Atlantis-II Mask — A hypo-allergenic silicone facemask from U.S. Divers. The popular Atlantis model is made from a translucent plate material which allows excellent light admission. Nose pocket permits pressure equalization. Perfect for underwater modeling, the new mask is available from U.S. Divers. \$37.



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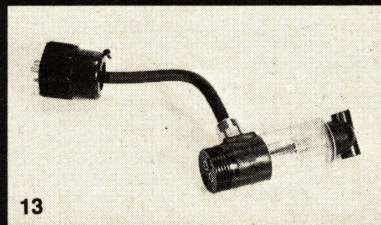
9 Quartz Watch — Constructed of burnished stainless steel, guaranteed to over 900 feet, the watch has a three year battery. The new ratcheted bezel sets easily, the crown is offset for comfort and protection, and the stainless steel band is adjustable. Blue, black, silver or orange face, \$349.95 from U.S. Divers.

10 Select-A-Fit Wetsuits — Dacor has introduced a new sizing system for their wetsuits; a system which enables a diver to mix any one of eight jacket sizes with 16 sizes of pants. The suits are available in 1/4 and 3/16 inch thicknesses, and include knee pads and a thigh pocket. The jackets are \$150, pants, \$110.

11 Divin' & Jivin' Duffle Bags — Crafted of durable vinyl-coated open mesh polyester, and stitched with heavy-duty nylon thread. Available as all-in-one, 26 inch duffle with separate, zippered regulator compartment, \$45. Standard 26 inch bag, \$30; 13 inch bag, \$17. Write Divin' & Jivin', Box 546, Ocala, FL 32670.



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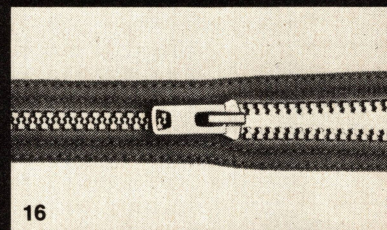
12 Super-Cinch Scuba Tank Backpack Band — Made of tough, rubber-sleeved, two inch wide nylon webbing with an infinite, velcro adjustment to fit all tanks. Super-Cinch is secured to the tank with a large, stainless-steel, over-center, high leverage buckle. Available on Scubapro Stabilizer jackets, backpacks, and as a kit.

13 EO Connector — A new connector with Ikelite's ICS bulkhead on one end and an EO connector on the other. The female EO is wired for solid state triggering, allowing dual use with Ikelite's flash housings or Substrobes. Priced at \$99.95, write Ikelite, 3303 N. Illinois St., Indianapolis, IN 46208.

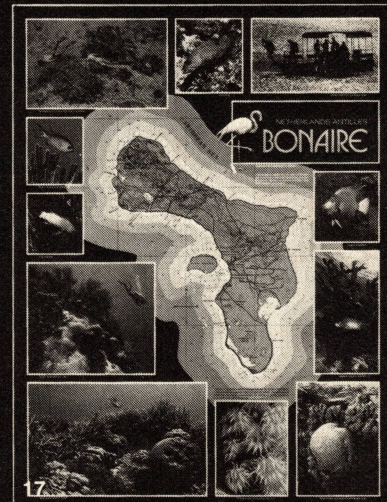
14 BC Stabilizing Jacket — Made of light blue Cordura nylon with silver trim, the new jacket features unique slots on each shoulder and at the waist, allowing the back-pack webbing to secure the jacket closer to the diver for better stability. Available in large or medium sizes, the jacket retails for \$270 at Dacor dealers.



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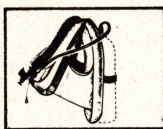
15 White Water BC — Racy silver BC with blue trim, and blue and orange stripes for style and visibility. Features 40 lbs. of buoyancy, the SeaQuest diamond harness, LP inflator, and a key ring holder in large expansion pocket. Retails for \$140.50. From SeaQuest, 722 Genevieve St., Suite #N, Solana Beach, CA.

16 Parkway's Zipper — All Parkway wetsuits now feature self-cleaning, non-jamming, non-freezing Delrin zippers. The new zipper is also non-corrosive and highly resistant to impact and abrasion; the large 10mm interlocking teeth even remain stable in sub-freezing waters. Parkway, 241 Raritan St., S. Amboy, NJ.

17 Bonaire Dive Map — Illustrates the best dive areas, hotels and dive shops, encircled by the beautiful U/W photos of Jerry and Michael Greenberg. This poster, along with five others, is \$15, plus \$3 postage and handling from Seahawk Press, 6840 S.W. 92nd St., Miami, FL 33156. A catalog is available for \$1.

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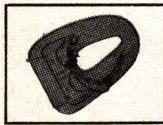
STABILIZATING B.C. Surrounds you with buoyancy. CO₂, oral & low pressure scuba inflation. Best kam-action bac-pac. **\$169.**



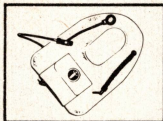
U.S. DIVERS COMPENSATOR. Over the shoulder. Complete with deluxe Kam Pac. Fits any tank. Low pressure inflator, overpressure dump valve, CO₂, etc. **\$129.**



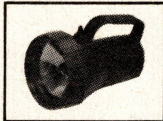
NEMROD AIR B.C. Super buoyancy compensator complete with push-button air tank. Approx. 4 minutes air supply. Over pressure, pocket, long neck hose, etc. **\$129.**



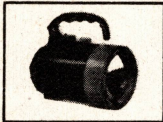
DOUBLE BAG B.C. Famous buoyancy compensator with twin pockets. Overpressure-dump valve, CO₂ detonator, crotch strap, 40 pound lift, etc. **\$69.**



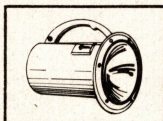
U.S.D. BC 700 New, 1980 Cordura B.C. Lever dump. 38gm CO₂. Low pressure scuba inflator. Whistle. In 52 or 38lb lift. **\$119.**



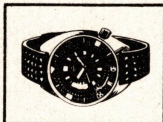
DACOR LIGHT. High intensity sealed beam. 50,000 initial C.P. Floats beam up. 6 Volt battery (not included). Good to 700 feet. Lasts 2 1/2 hours. **\$26.**



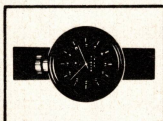
RECHARGEABLE. Ocean Pro light rated #1. Super bright light for 3 hours. Complete with 110V. charger. 1 year guarantee. Dependable and terrific. **\$79.**



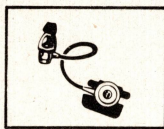
POWERFUL LIGHT. Good to 400ft. Rugged metal housing. 10 batteries (not included). Failsafe magnetic switch. **\$49.**



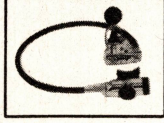
SEIKO WATCH. 17-jewel, self winding, auto date, amazing quality. Tested to 492 ft. One year guarantee. **\$139.**



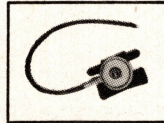
BOTTOM TIMER. Times dive precisely up to 60 minutes. Starts and stops automatically by water pressure. An important aid. **\$46.**



GREAT REGULATORS. Conshelf Supreme. Navy approved. Silicon enclosed 1st stage. **\$139.** Dacor Pacer 900 with "Venturamatic". **\$149.**



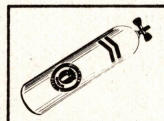
TEKNA PILOT. Newest technology for easiest breathing and minimum maintenance. Balanced piston, pilot second stage, 4 swivel ports, etc. **\$169.**



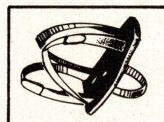
OCTOPUS. U.S. Divers second stage with longer hose. Fits any regulator. All metal construction withstands roughest use. Famous guarantee. **\$69.**



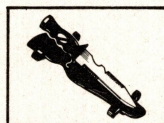
PRESSURE GAUGE. Famous make underwater pressure gauge. Fits all regulators. Luminous face, rubber cover, 1 year guarantee. **\$47.**



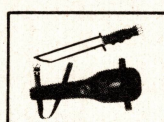
80 CU. FT. TANK. U.S. Divers Aluminum 80 J reserve with lifetime guarantee. Finest tank made. "Neutral buoyant". **\$139.** plus \$10. shipping.



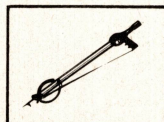
KAM BAC PAC. Deluxe pac complete with stainless steel band and rubber sleeve. Fits any size tank. All super-quick release. **\$39.**



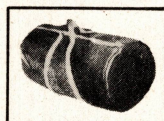
DACOR BLUNT TIP COMBO KNIFE. 2 saw-tooth areas on super-sharp smooth blade. Stainless. Rubber sheath. **\$34.**



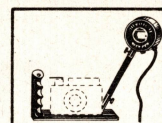
SWIMASTER. 7" stainless steel, lifetime guaranteed blade. Finest dive knife ever made. A working diver's tool, a sport diver's dream. **\$45.**



COMPETITION GUN. 36" overall. 2 slings, stainless steel shaft and parts, positive safety, automatic shock-line release. **\$49.**



GEAR BAG. Heavy duty naugahyde bag. Full 30" by 15". Deluxe zipper, outside gun ties, inner pocket, reinforced handles, etc. **\$24.**



STROBE OUTFIT for Nikonos II or III. Strobe, arm, handle, tray, quick-trigger. Wide angle. Fast recycle. To 250 ft. Foam lined carry case. **\$279.**



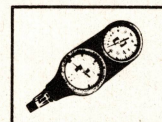
FARALLON. Tri-vue mask with super comfort. Spring loaded adjustable strap. Minimum displacement with easiest equalizing nose pocket. **\$32.**



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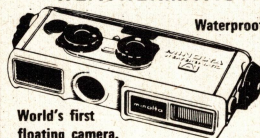
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(Continued from Page 87)

and can provide cross bearings of the site. Two bearings, even rough ones, can reduce the area of search considerably. Generally such bearings will be nothing more than two objects having been lined up by an observer. It is important in recreating these bearings to position the observer in as near the exact position as possible to that when the initial bearings were made. Even a small error in observer position can make the search area larger than it need be.

When an approximate search area has been defined, mark the limits of the area with buoys. In some cases these can be empty plastic gallon jugs with adequate lines and anchors to hold the marker float against wind and current drag. Remember that wind and currents can change, sometimes quite radically, so choose markers, lines, and anchors that will hold under the worst conditions.

Sunken boats, planes, outboards, and some other objects may release oil which produces a surface film. The diver may be able to spot this and buoy the approximate area as a starting point for the search. In addition to the buoy(s) marking the search area, the diver should take some accurate visual bearings of the site because an oily slick or the buoys may well disappear before the search and recovery is completed. When an underwater object is actually located this site must also be buoyed and visual bearings taken to mark the spot.

It is sometimes advisable to first locate a lost object by some method other than diving. Single grapnels or multiple grapnels on long drag lines are often used. Both involve the use of a boat (or boats) and lines connected to the drags. Each grapnel used should have ten feet or more of appropriately sized chain between the grapnel and the tow line. The grapnels and drag lines are towed behind the slowly moving boat until they hook an object. A diver can then make a quick check to inspect what has been hooked.

Single grapnel lines are best suited to dragging for lost anchor chains, wire slings, etc., that will probably be stretched out along the bottom. Grapnel lines should be hand tended and the dragging boat must proceed slowly if the search is to be successful. Multiple grapnels are fastened to a long line at suitable intervals and then dragged over the bottom by two appropriately separated boats when searching for drowning victims. Again, the lines should be hand tended so it can be determined when the drag hooks onto some object.

A grapnel is, usually, a four, five, or six prong metal drag with a ring at the end for attaching chain and line. Depending on their use, grapnels may weigh from

TIPS

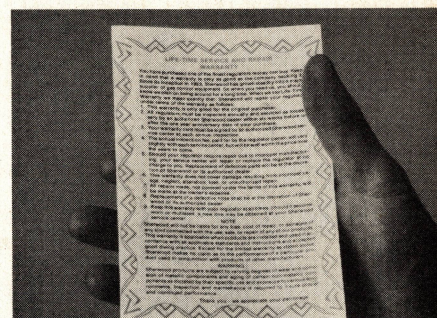
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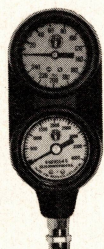
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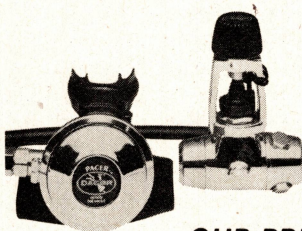


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five to as much as 100 pounds or more. The slender, sharper tines of a grapnel are more likely to hook into or under an object than are the flukes of a conventional anchor.

Assuming the approximate search area has been determined and buoyed, and that grapnels and other techniques have failed to locate the object, the search is now up to the divers.

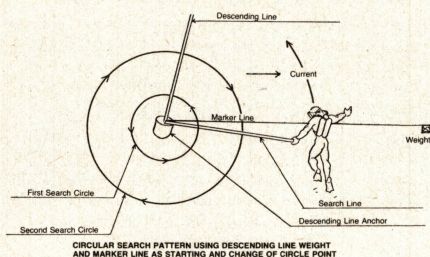
Successful search techniques all rely on one common element: The adoption and rigid adherence to a definite pattern. To be successful, the pattern must start at a known, marked, point; cover a known area; and end at a marked point. Otherwise, sections of the search area will be missed, or a great deal of overlapping may result.

There are three general patterns used in underwater searches: The circular, the jackstay, and the Z. The search pattern chosen must be the one that will best utilize the capabilities of the personnel and equipment available. The size of the object being searched for, bottom topography and visibility are also important influences. Regardless of the pattern chosen, each sweep made by the diver, or divers, must overlap some so that no bottom area is missed. If the object is not found in one complete sweep over the area by the circular search pattern, set-up and use either the jackstay or Z pattern.

The starting point for a search pattern is the last known position of the object, corrected for by wind and current drift. Any object that falls into the water and sinks will have experienced more drift as a result of current rather than of wind. But all objects do not necessarily drift exactly down current. Analyze wind and current conditions in a search area and determine the most likely starting point for a sunken object.

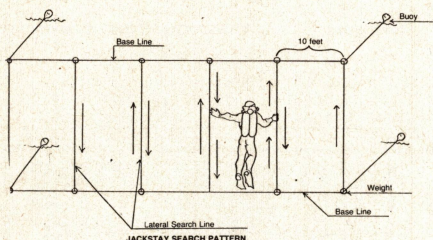
In establishing a circular search pattern, lower a weighted line to the bottom from the dive float or boat. This will be your descending line and weight. Attach a line to the weight that is long enough to cover as much of the search area as practicable. A polypropylene line that floats unless weighted is good. Another line, slightly longer than the search line, should be tied to the descending line weight and stretched out from this to a second weight to indicate to the diver that he has completed a circle. If a current is running, this marker line should be stretched down current. The diver now takes the line in one hand and, while searching the area, makes a circle around the descending line weight until he is again at the starting point (marker line). He then goes out another distance, equal to how far he can reach if working in turbid water, or how far he can see if

working in water with fair to good visibility. Progressively larger circles are made until the end of the search line is reached or the object found.



CIRCULAR SEARCH PATTERN USING DESCENDING LINE WEIGHT AND MARKER LINE AS STARTING AND CHANGE OF CIRCLE POINT

In using the circular pattern to search for large objects, such as a sunken car or plane, it will not be necessary to actually search each foot of the area. The diver can proceed to the end of the line and, while holding it taut along or near the bottom, start his search. When the line hangs up on an object he will be brought into a much tighter circle and will then circle back to his own search line. It is then only necessary to follow the line to the fouled point to inspect the object located. If it is not the object sought, clear the line and proceed around the circle. This method will not work on light objects or drowning victims because they are moved by the circling rope.



In the jackstay and the Z patterns a rectangular search area is laid out and buoyed. Long lines connect the bottom anchor weights along all four sides. Also, search lines are stretched between the base lines. The diver follows the lines until the object sought is found. If the object is not found, the buoys can be left in place to mark a searched area and new buoys established to mark successive areas. Base lines can be as long as practicable, depending on current, visibility, obstructions in the water, contour of the bottom, available rope, and the number of divers and boats. Yellow-colored, polypropylene makes good base line rope for either jackstay or Z patterns. Keep in mind that polypropylene rope floats and must be weighted to stay on the bottom.

The basic difference between the straight jackstay and Z pattern is that the divers cross in a Z from side to side instead of directly back and forth as in the jackstay pattern. With each crossing be-

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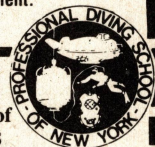
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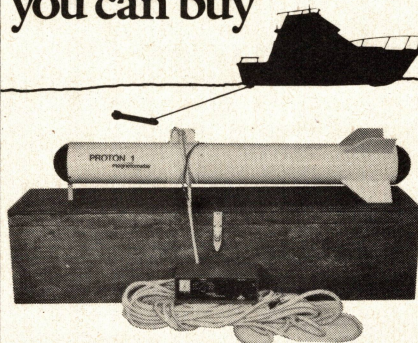
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tween base lines, the diver moves the end of the Z line ten feet along the base line and reswims the line. When the opposite base line is reached, the diver moves that end of the line ten feet and swims the pattern again. This results in some double coverage of the area, thus ensuring a more positive search.

In general, the circular search pattern is quicker to establish and swim, but is the least efficient. The Z pattern takes the longest time to establish (and the most material) and is the most efficient.

Plastic-coated wire is sometimes used and also makes good boundary lines for search patterns. When wire is used, the divers should carry wire cutters in a sheath in addition to the diver's knife in case they should become fouled.

If a lifeline is used in either of the search patterns by one or more divers, they, in effect, become tethered divers. Tethered divers must be careful not to pass under any object that will foul their lifeline(s) or prevent them from signaling to their safety man topside.

As pointed out previously, safety is even more important in commercial diving than in sport diving. The following dive safety tips may be repetitive to some divers, but are repeated here to emphasize the importance of safety planning in all commercial diving.

- 1). Always plan the dive. Don't just let it happen.
- 2). Always dive with a buddy or with a safety line tended by surface personnel.
- 3). Always establish a system of communication with the second diver or with surface personnel when working as a tethered diver.
- 4). Always calculate depth-time limitations for the deepest depth contemplated in regard to air consumption (duration).
- 5). Always stay within depth-time limits for no decompression.
- 6). Always calculate and plan for any required decompression that might become necessary.
- 7). Always analyze present and anticipated changes in the environmental conditions both on the surface and underwater. Be able to cope with the maximum change that can take place with the given set of circumstances.
- 8). Always personally check all your equipment just before the start of the dive.
- 9). Always discontinue diving, or delay start of diving, unless all conditions for the dive can be safely coped with. This includes physical condition of the divers and topside personnel. This represents the critical difference between sport diving and commercial diving. In

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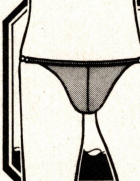
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- 2). Always stay within visual range of your dive partner, or, in greatly reduced visibility, use a buddy line.
- 3). Always be sure buoyancy is properly adjusted either by proper use of weights or, preferably, by the proper use of a well designed BC.
- 4). Always be prepared to render assistance to your dive partner and know life-saving techniques.

General dive safety precautions:

- 1). Always be sure you know what you are going to do when you reach the work area.
- 2). Always use a descending line when diving in turbid water with reduced visibility, in strong currents or when working in and around construction and salvage sites. Go down on the descending line and come back up on the same line.
- 3). Always proceed slowly when visibility is reduced.
- 4). Always surface before allowing any loads to be lifted off the bottom in the dive area.
- 5). Always send tools and equipment down to the diver on a line.
- 6). Always search an area by swimming or walking the search area. Never allow the diver to be dragged along the bottom.
- 7). Always have as much of the rigging and preparation work involved in an underwater task done topside prior to the actual start of the dive.
- 8). Always be extremely cautious when working around a wreck site. The thin, lightweight aluminum making up most of these objects shreds into razor-sharp fragments when they crash into the water. These shreds can instantly sever air hoses, lifelines, or a diver's hand.
- 9). Always keep yourself free of the bottom or any object on the bottom. Never tie yourself to any object underwater to retain a position.

The next ScubaTech will cover more search techniques and methods of working on various types of bottoms. Also recovery methods using floats will be discussed; including sketches for making workable floats from inexpensive materials which are readily available. In the meantime, send your questions and suggestions on commercial diving to ScubaTech, % SKIN DIVER Magazine, 8490 Sunset Blvd., Los Angeles, CA 90069.

Divers Directory



Advertising rate is \$81 for three consecutive ads, \$139 for six consecutive ads, \$214 for a full year. PAYMENT MUST ACCOMPANY COPY. Send all material to Diver's Directory, c/o Skin Diver, 8490 Sunset Boulevard, Los Angeles, CA 90069.

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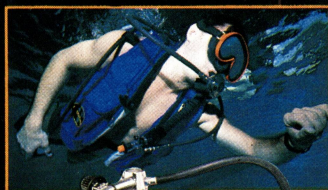
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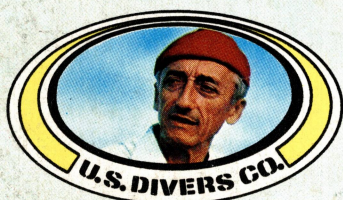
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